REGINA
Research Station
1931·1981

Agriculture
Canada

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Charcoal drawing by Darlene Hay.

REGINA
Research Station
1931-1981

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Preface

Three factors made the writing of *Regina Research Station 1931–1981* considerably easier than I had expected.

The first factor was the small size of the station during its early years. As a substation, first of the Swift Current Experimental Station, then of the Indian Head Experimental Farm, Regina was essentially a summer station until about 1950, and the staff requirements were consequently small.

The second factor was finding in the basement of the Indian Head Experimental Farm building most of the correspondence, pay sheets, invoices, and work orders covering the Regina substation for the period 1931–1949. This meant that the history of the station and its employees could be charted with relative ease. Unfortunately, on becoming an independent station the files and correspondence were not kept and maintained as carefully as they had been at Indian Head.

The third factor was the availability of station and government reports, the report on the history of weed control undertaken by the research station and written by Mr. E. S. Molberg on his retirement, and of course, the memories of staff members.

Because of the numerical smallness of the station staff and the information available, this history, instead of dealing exclusively with the research work carried out at the Regina Research Station, is more concerned with the people who have done so much to make it the center for weed research in Canada.

A. E. S.

Regina, Sask.
January 1981

Foreword

We were very pleased to accept the offer of Dr. Allan Smith to write the history of the Regina Research Station in recognition of its 50th anniversary.

We would like to thank him and all those who helped him record the events that took place. Certainly it will be of interest to those of us who helped to build the station, and we trust to others as well.

Two problems led to the establishment of the Regina substation and solutions to those problems have been found. The use of cultivators and the practice of maintaining trash cover on the soil surface essentially stopped the problem of erosion of soil by wind, and within 15 years the wild mustard problem on the Regina Plains was solved with the introduction of 2,4-D in 1945.

The amazing success of this herbicide on wild mustard led to further research to find ways to control other weeds that plagued the prairie farmers. As is apparent in this history many successes followed, and now, 50 years after the start of the station, not only wild mustard but most of the weeds in crops grown on the prairies can be controlled with herbicides.

Unfortunately, these advances have not been without their complications. Any new technology brings problems that must be solved before further progress can be made. The increase in populations of weed species resistant to certain herbicides, possible contamination of air, soil, and water by herbicides, and occupational hazards of exposure to herbicides are a few of the problems that have been encountered. Research has had to be mounted to deal with these and other problems.

It is now accepted that the sole reliance on herbicides for the control of weeds will not likely be a satisfactory strategy. Production systems for control of weeds will have to be developed that will integrate all means—chemical, biological, and cultural with the objective of minimizing the amount of herbicide that is introduced into the environment. More work will be required on the biology of weeds, biological control, and the methods of applying herbicides. This is the challenge facing the next generation of weed scientists.

J. R. Hay

Saskatoon, Sask.

CHAPTER 1

The Founding of the Regina Experimental Substation

1931

Before Confederation, agricultural concerns in Canada were taken care of by a Bureau of Agriculture. Under Confederation, the Federal Department of Agriculture was established on May 22, 1868 and continued to function for several years as before. However, by the early 1880s, it was realized that Canadian agricultural methods needed much improvement. In the West, new crop varieties and agricultural practices more suited to western conditions were sorely needed, while the established methods of farming in the East were rapidly becoming outdated.

A select committee of the House of Commons, headed by G. A. Gigault, Member of Parliament for Rouville, Que., was appointed in 1884 to determine how these necessary improvements could be made. Amongst its findings the Gigault Committee recommended the setting up of an experimental farm. Professor William Saunders of Northwestern University, London, Ont., was commissioned to study and report on the establishment of such an experimental program for agriculture. As a result of his report, Parliament passed the Dominion Experimental Farms Service Act on June 2, 1886, in order to develop improved methods of farming across Canada, and provide this information to the farmers.

Dr. Saunders was made the first Director of the Experimental Farms Service, a post he held for 25 years. Initially five experimental farms were established to fulfill Canada's agricultural needs. The Central Experimental Farm at Ottawa also acted as the headquarters for the Experimental Farms Service. Dominion experimental farms were set up at Nappan, N.S., to serve the Maritime Provinces; at Brandon, Man., for Palliser's Fertile Belt; at Indian Head, N.W.T., for the Palliser Triangle; and at Agassiz, B.C., for the Pacific Region.

The Dominion Experimental Farms Service Act stated that the main areas for investigation to be undertaken by the farms were livestock breeding and nutrition; dairying; the development of cereals and other field and orchard crops; the study of seeds, fertilizers, plant diseases, and insect pests; and diseases of domestic animals.

Before selecting Indian Head as the site for an experimental farm, Dr. Saunders made two visits to the Northwest Territories, the first in December of 1886, and the second in October of the following year. Accompanied by Angus Mackay, who was to become the first Superintendent of the Indian Head Experimental Farm in 1887, Dr. Saunders made a thorough survey of the region between Moosomin and Fort Qu'Appelle before 273 ha, close to the town of Indian Head, were selected and purchased. Under Mackay's direction a varied program was established. New methods for cultivation and seeding were developed, cereal breeding programs were set up to select crop varieties most suited to the region by being able to withstand the effects of drought, wind, frost, and rust, and a program to improve livestock production was also implemented. During his years as Superintendent, Angus Mackay made many valuable contributions to prairie agriculture, and upon his retirement in 1913 at the age of 73, a grateful government continued to make use of his services by appointing him Inspector of Western Experimental Farms, a position he held for the next 15 years.

In 1905, the settled portions of the Northwest Territories were given provincial status, and Alberta and Saskatchewan joined Confederation. The increase in the population of Saskatchewan meant that more land was broken to agriculture and more information on farming pactices was required by the new immigrant farmers who had settled in various parts of the province. Clearly, the Experimental Farm at Indian Head could not supply all the necessary new information, so in 1908 the Dominion Experimental Station at Rosthern, midway between Saskatoon and Prince Albert, was started. The Rosthern Station was to specialize in projects

which would aid farmers in the central area of Saskatchewan. A further station at Scott was opened in 1911 to develop agricultural practices suited to the dry windswept plains of northwestern Saskatchewan.

Dr. E. S. Archibald became Director of the Experimental Farms Service in 1919, remaining in that capacity for the next 30 years. Under Dr. Archibald's direction new experimental farms were established when and where the need arose. He believed that instead of setting up large experimental stations dealing with all aspects of agriculture, smaller stations investigating specific problems would better serve local agriculture. The first of these new stations was opened at Swift Current in 1920, where the main function was to develop cultural methods and cropping systems suited to the dry areas of southern Saskatchewan and Alberta. These programs were to counteract the problems of soil drifting, to conserve moisture, and to control weeds.

The area of Saskatchewan known as the Regina Plains consists of about 800 000 ha of fine textured lacustrine clay bounded by the cities of Regina, Moose Jaw, and Weyburn. This clay area is eminently suited to the growing of hard red spring wheat and by the late 1920s there were more than 6000 farmers operating in the region. However, low rainfall coupled with the use of cultural methods developed for farming in Europe or Eastern Canada, resulted in extensive soil drifting by the end of the decade. Other major agricultural problems of the Regina Plains at that time also included heavy infestations of stinkweed, yellow mustard, Canada thistle, and poverty weed. Because these weeds were not a problem in the soils found near Indian Head and Swift Current, the weed control studies being conducted at the two nearby experimental farms were not directly applicable to conditions on the Regina Plains.

Collectively, the farmers of the Regina Plains were producing more wheat than farmers of any other area in Western Canada, and for this reason deteriorating soil conditions and the presence of weed infestations were a serious threat both to them and to the economy in general. The Agricultural Committee of the Regina Board of Trade became increasingly concerned about the plight of these farmers and felt that because their problems could not be adequately solved by either the Indian Head or Swift Current experimental farms, a similar farm should be established on the Regina Plains. This farm could then work on the agricultural problems peculiar to the region.

These concerns culminated in a meeting of the Regina Board of Trade, held at the Hotel Saskatchewan on October 8, 1930. A resolution that an experimental farm be established for the Regina district was proposed by Mr. E. H. Morrison and seconded by Mr. V. Sifton. The motion was carried, and in the late fall of 1930 representations for the founding of a government-funded experimental station were made to Prime Minister Bennett and the Minister of Agriculture, the Hon. Robert Weir. Officials from rural municipalities and agricultural organizations in the Regina Plains also gave their support and encouragement for the founding of an experimental farm.

Both the Prime Minister and the Minister of Agriculture were sympathetic to the problems being encountered by the farmers of southern Saskatchewan, and the proposal of the Regina Board of Trade was sent to Dr. Archibald for consideration. At first the Director of the Experimental Farms Service thought that the needs of the prairie farmers could best be met by the establishment of either a District Experiment Station or an Illustration Station. There were several such stations within an 80-km radius of Regina where a variety of agricultural problems were being studied on local farms (instead of federally owned farms) as an extension of the comprehensive work being done by the Indian Head Experimental Farm.

In March 1931, Dr. Archibald visited Regina and was met by a delegation from the Regina Board of Trade. Dr. Archibald also discussed the regional agricultural problems with Mr. W. H. Gibson, Mr. J. G. Taggart, and Mr. W. H. Fairfield, the respective Superintendents of the Indian Head, Swift Current, and Lethbridge experimental stations. Following his visit to Regina, Dr. Archibald wrote to the Minister of Agriculture on March 12, 1931 and said that, while he could not support the setting up of a fully equipped experimental farm because of the expense and unnecessary duplication of work being done at Swift Current and Indian Head, he would certainly recommend the establishment of a special government-funded substation where experimental work could be conducted. It was further suggested that the substation be placed under the guidance and control of Mr. Taggart, the Superintendent of Swift Current Experimental Station.

Mr. Taggart was therefore entrusted with the task of obtaining a 10-year agreement for land at a suitable site, organizing the future research program, and finding a qualified person to take charge of the various experiments. In April 1931, he spent 2 days in Regina discussing the role of the future station with farmers and representatives from the provincial government. Mr. Taggart met with the Regina Board of Trade members at Wascana Hotel on April 15, and reported that their endeavors had been successful, and that he was in the area with the express purpose of locating a site for the future substation.

As a result of these meetings and discussions, and after considering the questions of soil type, soil drifting, weed infestations, and accessibility to the public, Mr. Taggart wrote to Dr. Archibald on April 16, informing him that the proposed substation should be located at Regina rather than on alternative sites at Drinkwater, Moose Jaw, or Rouleau. Dr. Archibald was further informed that the substation should be sited about 3 km south of the city near to the junction of Nos. 1 and 6 highways, and that, of the four specific locations examined by Mr. Taggart, the one personally recommended consisted of a half-section of land owned by the provincial government. There were, however, no buildings on this land. Mr. Taggart noted that the Provincial Department of Agriculture had been conducting weed control experiments at Drinkwater, 48 km southwest of Regina, but was willing to close this station and sell its buildings and equipment to the federal government for use by the proposed substation.

These recommendations were communicated by Dr. Archibald to the Deputy Minister of Agriculture, Dr. J. H. Grisdale, on April 21, 1931, and approval was granted 4 days later. A wire was sent to Mr. Taggart informing him of the decision, whereupon an agreement was signed with the provincial government giving the Experimental Farms Service use of the land in the West Half-Section of Section 8, Township 17, Range 19, West of the 2nd Meridian, for a period of 5 years, starting May 1, 1931, with an option to renew for a further 5-year period. The rent for the 96 ha was $8.75 a hectare per year.

Discussions were also held between Mr. Taggart and Mr. F. H. Auld, Saskatchewan's Minister of Agriculture, regarding the future of the Provincial Weed Experiment Station at Drinkwater. This station had been established by the Provincial Department of Agriculture on farmland belonging to Mr. R. A. Wright and Mr. C. Carey, and consisted of 29.6 ha, fenced and fully equipped with machinery. Experiments were being conducted on the control of wild mustard, wild oats, stinkweed, and Canada thistle. Although financed by the provincial government, the actual experimental work was directed by Dr. L. E. Kirk, Professor of Field Husbandry at the College of Agriculture, University of Saskatchewan. In 1930, Mr. W. S. Chepil was in charge of the Drinkwater Station under Dr. Kirk, additional labor being provided by George Miller and Robert Fitzgerald.

Both 1929 and 1930 were drought years in southern Saskatchewan, consequently no experimental results were obtained for either year at Drinkwater. Since the provincial government was also conducting weed control studies at Watson, Lockwood, Eston, and Gravelbourg, Mr. Auld agreed to discontinue the studies being undertaken at Drinkwater and sell two buildings and the equipment from the Weed Experiment Station to the Dominion Experimental Farms Service for the sum of $2064.49. It was understood that the experiments initiated at Drinkwater would be continued at Regina.

Land, buildings, and equipment had been acquired and all that remained was for Mr. Taggart to hire the services of Mr Chepil for the full-time position of Officer in Charge of the new substation. His classification was that of graduate laborer. George Miller and Robert Fitzgerald were also taken on by the Experimental Farms Service for the summer season of 1931.

By the beginning of May 1931, the necessary negotiations were completed and on the front page of the Regina *Leader-Post* for Thursday, May 7, 1931 it was proudly proclaimed:

EXPERIMENTAL FARM TO BE ESTABLISHED NEAR REGINA AT ONCE

The *Leader-Post* went on to state that the site was 4 km southeast of the city, and that the purpose of the Regina Substation was to conduct experiments on soil drifting, weed control, crop rotations, and the growing of various crops such as grasses and all varieties of grain.

Thus, the substation was reality only 7 months after the initial resolution had been passed by the Regina Board of Trade.

CHAPTER 2

The Early Years

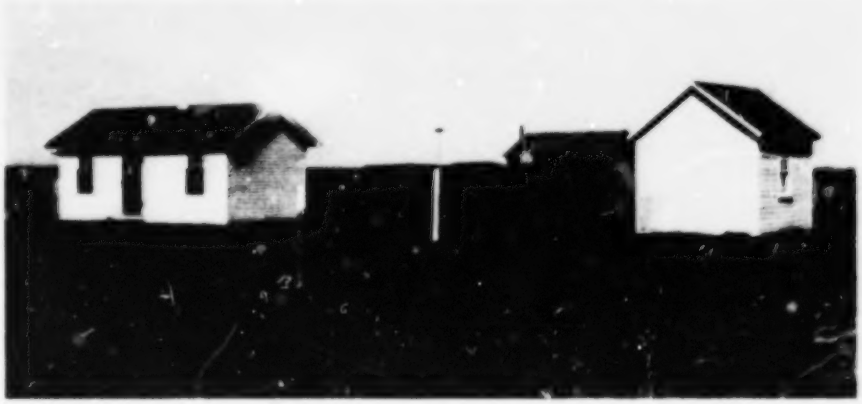
1931–1935

Dr. Archibald wrote to Dr. Grisdale on May 18, 1931, informing him that the substation recently established at Regina for the purpose of studying soil drifting and weed control was now fully equipped, and work was proceeding nicely. Records for 1931 indicate that the early days of the substation were chaotic. Buildings and equipment were purchased in late April from the Provincial Weed Experiment Station at Drinkwater and had to be brought to Regina. Plots were marked out, additional equipment purchased, seed was required, and the host of supplies and sundries needed to set up the new substation had to be obtained.

Mr. Taggart was on hand during the first week of May, and with Mr. Chepil, George Miller, and Robert Fitzgerald organized the transfer of two buildings and machinery to the Regina location. The move started about May 4, and was completed within a few days. For moving the buildings from Mr. Wright's farm to the city, Mr. John Deacon of Regina submitted an account to the substation for $45.00. The buildings in question consisted of a small field office and a storage shack. Purchases of bedding and other household effects in May 1931, suggest that one of these buildings was used, at least temporarily, as a bunkhouse. A granary was bought or constructed during the summer.

A telephone was installed, with the easily remembered number 8765, and Post Office Box 516 was rented. The substation retained both these numbers for many years.

There were no sewage facilities or electricity at the station. Water was obtained from either Wascana Creek or a standpipe 1.6 km west on Albert Street. However, these spartan conditions did not daunt Bill Chepil, George Miller, or Bob Fitzgerald who were to remain with the substation for many years.



William Stephen Chepil was born at Gimli, Man. on January 1, 1904. He received a B.S.A. degree from the College of Agriculture of the University of Saskatchewan in 1930, and was awarded an M.Sc. degree from the same university in 1932. Before coming to Regina as Officer in Charge of the new substation, he held a similar position at the Drinkwater Station. Those who still remember him all agree that Bill Chepil was personable, competent, and intelligent; moreover, he was held in high regard by his superiors both at Swift Current and in Ottawa.

Little is known about Robert Fitzgerald, who had also been employed at the Drinkwater Station, but he was a constant summer employee of the substation until the end of 1940.

George Miller was born in Devonshire, England, in 1889. He came to Cupar, Sask. in 1910, and worked on farms in the area until 1916 when he enlisted in the Canadian Expeditionary Force. After serving in France with the 5th Battalion during the First World War, and then with the Occupationary Army, he returned in 1919 to Cupar and a life of working on local farms. In the spring of 1929, he joined the newly opened Weed Experiment Farm at Drinkwater and remained there until he was hired by the Regina Substation.

Despite the hectic weeks following the opening of the station, the programs devised by Mr. Taggart and Bill Chepil were organized. During the first year cultural experiments, herbicide tests, and weed ecology studies were set up.

above
July 1931
Regina Experimental Substation buildings—moved from Drinkwater in May 1931.
below
William Stephen Chepil, Officer in Charge, 1931-1936.

above
ca 1930
Wheat field heavily infested with wild mustard.

below
ca 1930
Soil drifts in a field near the substation.

The cultural experiments were undertaken to devise summerfallow practices for the eradication of Canada thistle and to observe the effects of bare fallow on the root systems of Canada thistle and poverty weed. Methods for preparing and seeding fallow and stubble land were also studied.

Experiments with herbicides included the use of sulfuric acid and copper nitrate sprays for control of wild mustard and stinkweed in a variety of cereal, oil seed, and forage crops. The control of the perennial weeds Canada thistle and poverty weed using sodium chlorate was investigated. Data were collected to find the most susceptible stage for weed control using chemicals, while determining the stage of crop growth most resistant to the herbicidal applications.

The purpose of the weed ecology studies was to observe how weed populations were affected by various tillage and cropping practices. Also, the density of weed seeds present in the soil at various depths was measured and the viability of these seeds determined through propagation studies. Growth and propagation studies were done on Canada thistle and poverty weed to develop methods better suited to the destruction of these perennial weeds.

A busy program, but the first year was not successful. In the Regina area a lack of snow during the winter of 1930–31, and a dry spring resulted in one of the severest droughts ever experienced. Soil drifting was extensive that summer; consequently no grain was harvested that first year at the substation, an occurrence that has never happened since.

At the end of October 1931, the seasonal laborers George Miller and Bob Fitzgerald were laid off. Bill Chepil visited Swift Current, attended agricultural meetings in the province, and wrote his comprehensive annual report describing the results obtained from the various tests and experiments.

In April 1932, George Miller and Bob Fitzgerald were rehired. That year George married Stella Brown of Cupar and brought his bride to the substation, where they lived for the rest of

their married lives, except for a year spent in British Columbia during the 1940s. George Miller was taken on permanent staff by the federal government in 1933 and the Millers lived in a cottage on the substation. Mrs. Miller ran the bunkhouse from 1932 until her husband's death in 1955.

During the working season George acted as Farm Foreman and during the winter the Millers looked after the substation and equipment, took the meteorological records, and made plot marker cards. Another winter job involved the hand threshing of the grain samples from the various test plots, and the counting of weed seeds.

The office at the substation was primitive in those early years and the officers in charge would either work at home during the winter months or rent office space in the city. There are no records of any secretarial help then. Despite the occasional visit from Bill Chepil, the winters must have been lonely months for the Millers. Further construction took place during the early 1930s, and a photograph taken in 1934 shows the Miller's residence, two granaries, an implement shed, the office, a bunkhouse, and a privy.

The years 1931–1935 were challenging times for the new Regina Substation. This was the beginning of the "Dirty Thirties" and the depression that was to affect the agricultural and industrial production of almost the entire world. During those years, despite poor crop conditions, soil drifting, lack of snow and rain, grasshoppers, and the rust outbreak of 1935, work at the substation continued and was expanded. Extra summer staff was hired. For the seasons of 1933 and 1934, N. A. Langhorne and G. Secret were taken on strength, in addition to Bob Fitzgerald. William Shevkenek and Lyle Treble were hired for the summer of 1935. By 1935, work was progressing so well that on April 1, an additional 64 ha of land from the southeast Quarter of Section 7, Township 17, Range 19, West of the 2nd Meridian were leased from McCallum Hill & Co., Ltd. for a 4-year period at a rent of $10.00 a hectare per year.

above left
Summer 1934
Buildings at Regina Experimental Substation.

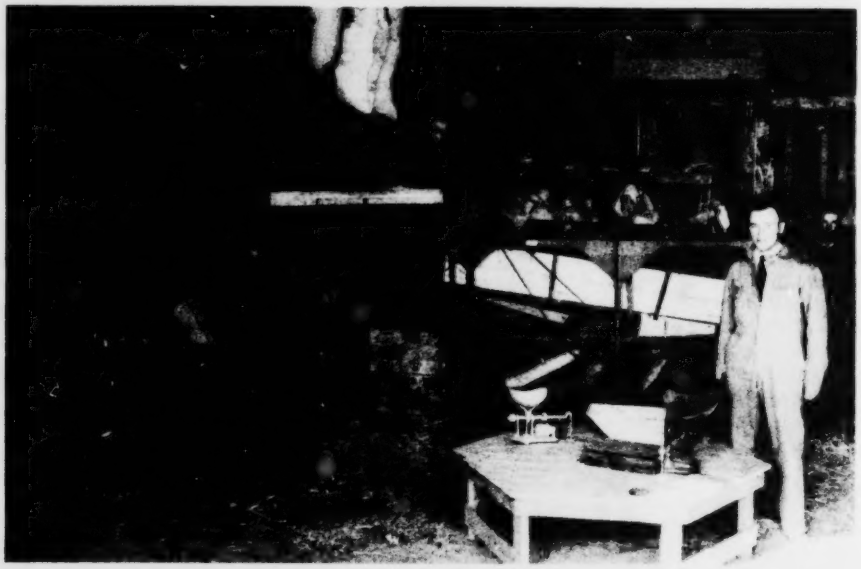
below left
July 1935
Binding brome grass—George Miller on tractor.

above right
July 1935
George Miller washing out soil samples for weed seed population study.

During the initial years of the Regina Substation, operating fields in strips and light sowing cover crops on fallow was practiced and tillage methods better suited to summerfallow were developed as a means of reducing soil drifting. Methods for destroying weeds on summerfallow using tillage procedures were compared. The land surrounding the substation was heavily infested with wild mustard, stinkweed, Canada thistle, and poverty weed, and the herbicidal work with sulfuric acid, copper salts, and chlorates was continued. Summerfallow, tillage, and cropping practices were shown to be effective against Canada thistle. Cultural control of this weed was aided by the low rainfall of the early 1930s and the damage caused by both grasshoppers and the larvae of the thistle butterfly (*Vanessa cardui*).

Wild mustard was by far the most troublesome weed on the station and much work was directed at its control. The effects of rates of crop seeding, varying seeding dates, fertilizer, crop rotations, chemical control agents, and harrowing were all tested in attempts to control this scourge. The weed ecology studies were also continued and developed. Time was found to initate a program on the effects of fertilizers on crop yields.

The Regina Board of Trade, which had done so much toward its establishment, maintained close ties with the substation. In 1932, a committee was formed to support and popularize the station. Meetings were organized to secure the cooperation of the farmers in the region to record their tillage practices and this information was used by the Regina Substation to study soil drifting under various farming conditions. During the early 1930s field days jointly organized by the substation and the Regina Board of Trade were started. These field days are still being held. Farmers attending the field day of 1934 listened to an address by the Provincial Minister of Agriculture, the Hon. J. G. Taggart, who that year had left Swift Current and federal service to successfully stand for the Saskatchewan Legislature. After the Hon. J. G. Taggart's address there were discussions on methods for controlling soil drifting. These discussions were held under the chairmanship of Mr. John Cameron who, in 1936, was to



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become the next Officer in Charge of the Regina Substation.

Agricultural conditions on the prairies continued to deteriorate as a result of soil drifting and drought, and swift federal action was needed to provide both the necessary money and research to counteract the terrible conditions. The Prairie Farm Rehabilitation Administration (PFRA) Act of 1935 was enacted to "... provide for the improvement of agricultural conditions in those parts of the Prairie Provinces which in recent years have suffered from drought and soil drifting ...." This Act, initially under the direction of the Minister of Agriculture although it was later to come under a separate administration, was designed to alleviate the prairie agricultural problems by improving cultural practices, conserving water, and controlling land use. Much of the early work for the program was undertaken by the experimental farms and stations on the prairies, and in 1935 approximately 10 percent of the funding for the Regina Experimental Substation was provided by PFRA sources.

In 1935, the second chapter in the history of the substation began when the administration and supervision was transferred from Swift Current to the Indian Head Experimental Farm where Mr. W. H. Gibson was Superintendent.

CHAPTER 3

Hard Times

above
John Cameron, Officer in Charge, 1936-1945.

below
September 1936
George and Stella Miller.

1936–1945

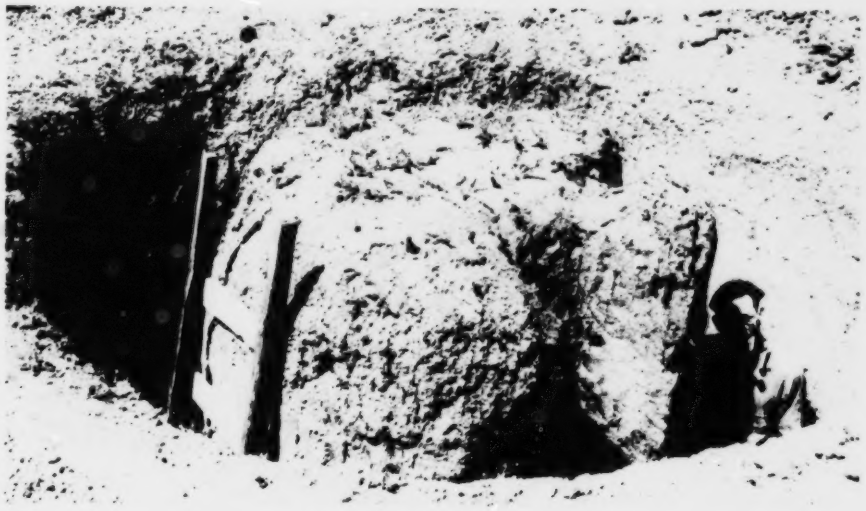
Under the administration and supervision of Mr. Gibson and the Indian Head Experimental Farm, the studies being done at the Regina Substation were continued.

The work on soil drifting at Regina was beginning to receive the favorable attention of Bill Chepil's superiors. When a position was created in Ottawa, in 1936, for a soil scientist, Dr. Archibald wrote to Mr. Gibson requesting the names of possible candidates. Mr. Gibson replied that Bill Chepil was eminently suitable for the position, but did they really want to remove him from Regina where his work was of such importance? The worth and quality of his work was recognized early in 1936 when he was promoted from graduate laborer to professional status; and in the fall of 1936 he was transferred to the Soil Research Laboratory at Swift Current to undertake research on the wind erosion of soil and its prevention.

The Soil Research Laboratory, located at the Dominion Experimental Station at Swift Current, was opened in June 1936, as a result of the 1935 PFRA Act, to conduct studies into soil fertility, moisture conservation, and wind erosion control. Although this laboratory was under the supervision of the Experimental Farms Service of the Department of Agriculture, it remained a separate entity under the PFRA cultural program until 1957, when it became a section of the Swift Current Experimental Station.

Except for two leaves of absence, Bill Chepil continued with his studies into the mechanisms of wind erosion at the Soil Research Laboratory until 1948. The first leave between 1937 and 1939, enabled him to attend the University of Minnesota to undertake postgraduate studies, resulting in his being awarded a Ph.D. degree in early 1941. During 1946, Bill began an 18-month assignment in the Chinese Provinces of Honan and Anwhei as a soil reclamation specialist with the United Nations Relief and Rehabilitation Administration (UNRRA). In 1948 he left Swift Current to take up a position with the Agricultural Research Service of the U.S. Department of Agriculture (USDA) at Kansas State University, Manhattan, Kans. There he held the dual title of Soil Scientist (Research) USDA and Professor of Soils, Kansas State University, and was responsible for soil erosion research. His work was successful and in 1961 he became Research Investigations Leader for Soil Erosion in the Southern Plains Branch of the Soil and Water Conservation Research Division of the Agricultural Research Service. At his death on September 6, 1963 at the age of 59, Dr. Chepil was a world-renowned scientist in the area of soil erosion, its causes, and its control. On this and related subjects he had published over 90 papers in the scientific literature.

John Cameron, who became the second Officer in Charge of the Regina Experimental Substation in August 1936, had a completely different background from that of Bill Chepil. "Jock" Cameron, born in Greenock, Scotland in 1889, was the eldest of five children. The Camerons came to Canada in 1903 and homesteaded in the Saskatoon district. As a young man he worked on the family farm and attended the University of Saskatchewan. In 1915, after the outbreak of the First World War, John Cameron joined the Princess Patricia's Canadian Light Infantry and saw active service in France during 1915 and 1916. He was wounded twice, and in April 1917 was invalided out of the army and repatriated to Canada and Saskatoon. Mr. Cameron reentered the University of Saskatchewan and graduated with a B.S.A. degree in 1918. For several years he was manager of the Saskatchewan Farmers' Mutual Fire Association. After a few years in California he returned to Saskatchewan and entered the service of the Field Crops Branch of the Provincial Department of Agriculture. He was, for a time, responsible for the chemical weed control experiments being done at Jansen, Sask. In 1932, John Cameron left the Saskatchewan government to become Provincial Sales Manager of the Commercial Fertilizer Division for the Consolidated Mining and Smelting Co., a position he held for 4 years before his appointment as Officer in Charge of the Regina Substation, where he remained until January 1945. Jock Cameron seems to have been a



quiet but friendly man with a sense of humor and a ready joke. Mrs. Stella Miller recalls that his daughter did not take it kindly when Jock Cameron taught his young grandson the soldiers' versions of First World War army songs.

Mr. Cameron's staff at the substation was small, George Miller being the only other permanent member. Bob Fitzgerald worked every summer until the end of 1940. During the latter part of the 1930s Lyle Treble was a regular summer employee, and William Shevkenek was employed continuously from April 1935 until May 1937, his winter wages being paid out of PFRA funds. Other staff was hired temporarily as and when the need arose. Mrs. Miller was, of course, still responsible for the bunkhouse.

At this point it seems appropriate to mention Bert Smith, who was first employed at the Regina Substation in the summer of 1943. Albert Edgar Smith was born in England in 1890 and immigrated to Canada during the early 1900s. He worked on farms in the Cupar district and thus met the Millers. An excellent worker, he was offered and accepted a permanent position at the substation in 1947 and remained on staff until his retirement in 1959. Bert Smith was a bachelor.

During the late 1930s and early 1940s, life at the substation followed the pattern set in the earlier days. Work was done only in the summer season, and in the winter John Cameron rented office space in the city and caught up with his paper work and report writing. For eight winters, starting with that of 1936-37, office space was leased in the Darke building in what is now the Medical Arts building. During the winter of 1944-45, John Cameron's office was located in the Cornwall building. There is no reference to any clerical staff; John must either have done his own typing or sent his reports and correspondence to Indian Head for typing. In early 1941, C. B. Dawson was hired briefly to type the Annual Report for 1940.

For the farming population of the Regina Plains the second half of the 1930s was as bad as the five preceding years. The problem of drifting soil coupled with economic recession meant that even the crops which the farmers were able to grow could only be sold at low prices. Farm incomes were at an extremely low level and financial assistance was necessary to keep many farmers in operation. The value of farmland continued to depreciate and in the absence of buyers farms were being abandoned. In 1937, another drought year, crop yields at the substation and in the province were the lowest ever on record. Grasshoppers caused considerable damage during the period 1937-1939, but fortunately became less troublesome after 1940. During the early 1940s, the wheat stem sawfly (*Cephus cinctus*) started to become an increasingly serious pest.

The outbreak of the Second World War in 1939, influenced world markets and economic recovery followed. Farming products were in great demand and sold for comparatively high prices. Thus, in 1942 crop yields in Saskatchewan were at an all-time high and the price of land had doubled since 1937. As a result of the new cultivation practices initiated at Swift Current and Regina, soil drifting on the Regina Plains became less of a problem in the early 1940s.

left
ca 1940
Perennial root excavation by Bob Fitzgerald.

right
Winter 1946-47
Long-time employee Bert Smith standing beside bunkhouse.

above
1936
The Darke building, in which office space was leased for eight successive winters for the Officer-in-Charge.

opposite page • above
1937
Dr. C. Bassi cutting crop.

opposite page • center
Summer 1936
Cutting green feed with the help of hired horses.

opposite page • below
ca 1940
Control of wild mustard with 4% copper sulfate solution. Check plot on right.

During the period 1936–1945 work at the Regina Substation settled down to routine experiments, many of which were a continuation of those initiated by Mr. Taggart and Dr. Chepil. No significant new studies were conducted. The major emphasis of the substation was to reduce soil drifting, using cropping and tillage practices. Thus, investigations comparing the effects of summerfallow methods, spring tillage, strip farming, cover crops, and straw spreading, on the control of soil erosion, were continued.

Weeds were still a problem on the Regina Plains, with wild mustard being by far the worst offender, although stinkweed, poverty weed, and Canada thistle were also troublesome. The cultural methods for weed control were continued, and the effects of crop type, crop rotation, summerfallowing, harrowing after seeding, and rates, dates, and depth of crop seeding on weed densities were studied. During the drought years, Canada thistle had responded so well to the cultural control practices that by 1936 the project was curtailed owing to a lack of suitable stands on the substation for further experimentation.

The herbicide studies with sulfuric acid and copper salts were continued, and in 1939 weed control work with cyanamid was started. The overall opinion of these herbicide investigations was that, as a means of controlling wild mustard and stinkweed, such treatments were just too expensive to be of general and widespread use. Besides, use of sulfuric acid and copper salts meant that corrosion-free spraying equipment was needed.

In addition to these programs, time was found to continue the weed ecology studies and to measure weed seed populations in the soil and assess their germinating potential. Losses of wheat, oats, and barley caused by various densities of wild mustard were documented. Crop rotation studies, cultural and cropping experiments, and fertilizer tests were also conducted and compared to measure crop yields under the different cultural conditions.

Reorganization of the Experimental Farms Service in 1937, the first since its inception in 1886, did not affect the Regina Substation, which continued to remain within the Field Husbandry Division of the Service.

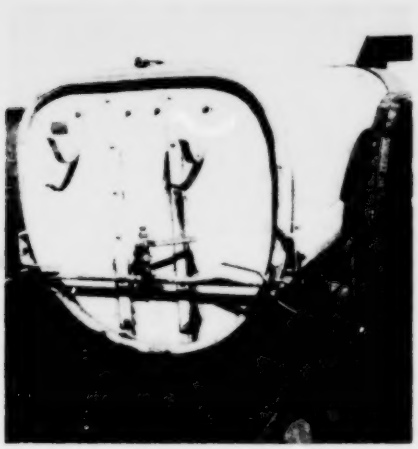
During the period 1936–1945 very little building was done at the substation. Photographs show that a porch was added to the Miller's residence, and that some trees were planted about the site. There was still no electricity, gas, or sewage facilities, and water was obtained from either the creek or the standpipe on Albert Street. The lack of building was not due to lack of confidence in the substation, but rather to the poor financial circumstances experienced throughout the 1930s and to the fact that the federal government did not own the land on which the substation was situated.

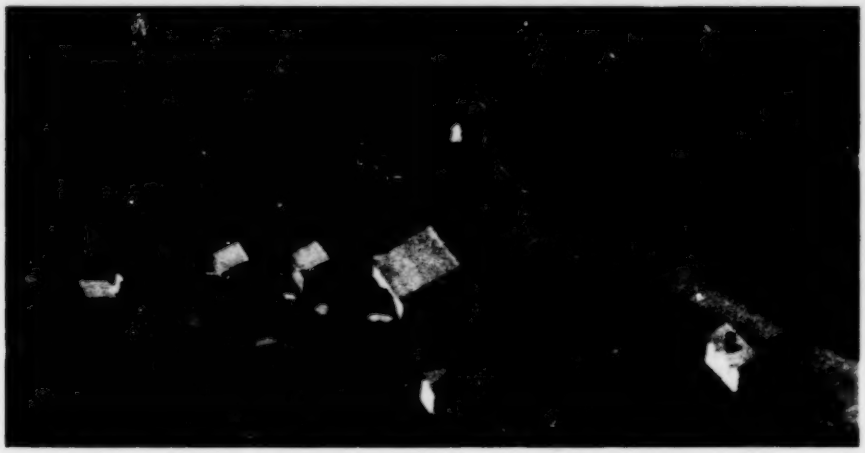
The original 5-year lease for the land from the provincial government had expired in 1936 and was renewed for a further 2-year period in 1936 and again in 1938. In a letter dated August 29, 1939 to Dr. Barton, the Federal Deputy Minister of Agriculture, Dr. Archibald wrote of his misgivings regarding the current status of the Regina Research Station. He paid trib-

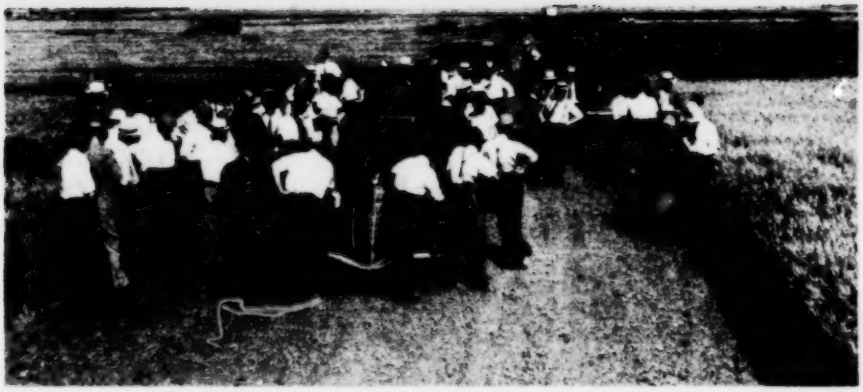
ute to the work being done at the station and noted that this should be continued for at least another 5-year period. However, he remarked that he was reluctant to recommend further investment in buildings and equipment without the federal government having any equity in the land on which the substation was sited.

The provincial government was approached and on March 11, 1940, for the sum of $1.00 per year, the land originally rented from the Saskatchewan government was leased to the government of Canada from May 1, 1940 for as long as it was required for use as an experimental substation. The 64 ha rented from McCallum Hill & Co., Ltd. were leased for further 4-year periods in 1939 and in 1943, the rent remaining at $10.00 a hectare per year. The Second World War prevented any intended improvements and expansion from being made at the Regina Substation.

In March 1944, the Millers left Regina to go to Cloverdale,B.C. to raise chickens. This must have been a great blow to John Cameron, because George Miller had been the mainstay of the substation from the day of its founding. Also, the bunkhouse had lost the capable services of Mrs. Miller. As a result of the war, staff was increasingly hard to find and John Cameron had difficulty getting a suitable replacement. He decided to try and obtain the services of a student from the University of Saskatchewan. Accordingly, arrangements were made through Dr. Kirk, Dean of the College of Agriculture, and William Darcovich, B.S.A., was engaged on a permanent basis from May 1, 1944 as Graduate Assistant in Field Husbandry Investigations.







above left
ca 1940
Sulfuric acid sprayer.

above right
July 1938
View of substation buildings from north-northeast; Winnipeg Street at upper right.

below right
July 1938
Mr. John Cameron speaking to farmers at field day.

The next person to leave the substation was John Cameron, who had done so much to guide the station through the hard times of the late 1930s and then through the war years. John Cameron had always maintained a close interest in veterans' affairs, and while in Regina held executive offices in the Royal Canadian Legion, including that of President. In January 1945, he resigned as Officer in Charge of the Regina Experimental Substation and accepted a position with the Department of Veterans Affairs in Regina, as Head of the Soldiers' Settlement Board. Mr. Cameron remained with Veterans Affairs until 1949 or 1950. He then moved to the West Coast where he stayed until his death in the 1960s.

Until a new Officer in Charge could be appointed, Bill Darcovich became Acting Head of the substation in early 1945.

CHAPTER 4

The Postwar Years

1945–1953

William Darcovich was born in the Ukraine on July 3, 1921 and came to Canada with his family in 1928. He entered the Agricultural College of the University of Saskatchewan and was awarded his B.S.A. degree in 1944, the same year he joined the staff of the Regina Substation. In January 1945, by a series of circumstances he was Acting Officer in Charge and sole member of the substation during that winter. Fortunately for Bill, Mr. and Mrs. Miller returned to Regina from B.C. in the spring of 1945. George was again hired as farm foreman of the substation and Mrs. Miller resumed her custodianship of the bunkhouse. So, with the help of Bert Smith, who had started work just before the Millers' return, the task of setting up the usual field experiments got underway.

The 1945 season marked the beginning of a new era for the Regina Substation, for it was then that the testing of new weed control chemicals, supplied by the Ottawa Central Experimental Farm, was commenced. Among the herbicides to be tested were Sinox (dinoseb), and the recently discovered Weedone (2,4-D). The latter chemical was to revolutionize agriculture in Western Canada.

In October 1945, Bill Darcovich left the substation to return to the University of Saskatchewan and undertake an M.Sc. program in farm management. This was followed a few years later by a Ph.D. program in agricultural economics from Iowa State University. Today Dr. William Darcovich is Chief, Farms Income Analysis Section of the Regional Development Directorate of Agriculture Canada, in Ottawa.

Late in 1945, James Roe Foster was appointed Officer in Charge of the Regina Substation. Born in Myrtle, Ont., on July 24, 1907, Roe Foster came as a boy to Denholm, near North Battleford, Sask., where his father settled to farm. From 1926 until 1932 Roe Foster helped on the family farm and then attended the University of Saskatchewan. In 1937, after obtaining a B.S.A. degree, he joined the Experimental Farm at Indian Head and worked on PFRA supported offstation reclamation programs until 1941, when he enlisted in the RCAF. After the war, he returned to the Indian Head Experimental Farm in the fall of 1945 and was immediately appointed Officer in Charge of the Regina Substation.

Roe Foster spent the winter of 1945–46 at Indian Head, familiarizing himself with the program being carried out at Regina, and thus did not come to the substation until April 1946. Because there was no one at Regina to deal with the mail, complete the time sheets, and do other necessary clerical duties, Mr. Gibson, the longtime superintendent of the Indian Head Experimental Farm, hired Mrs. Miller that winter for 2 hours a day to look after such matters.

In 1946, further tests were conducted with 2,4-D. The work of the previous season initiated by Bill Darcovich had shown that both dinoseb and 2,4-D were tremendously effective against wild mustard and stinkweed. Because 2,4-D had many advantages over the former chemical, further testing with dinoseb was discontinued. The long-established work with sulfuric acid and copper salts was also joyously terminated; the corrosive acid had a tendency to eat through coveralls and other clothing.

During 1946, Roe Foster and George Knowles from the Central Experimental Farm at Ottawa made further field tests with 2,4-D using a Buffalo turbine sprayer, which provided crop coverage yet only required 55–80 L of water per hectare. This was the first time that herbicidal sprays using such small quantities of water had been applied in Western Canada. Wild mustard and stinkweed were selectively and completely

left
William Darcovich, Acting Officer in Charge, 1945.

right
James Roe Foster, Officer in Charge, 1945–1947; Superintendent, 1948–1953.

removed from the growing crops, the chemical was relatively inexpensive and easy to apply, and the cost was more than covered by the increased crop yields. No wonder farmers in the area were impressed. Word of the new wonder chemical spread quickly and during the summer of 1946 a delegation of farmers from North Dakota visited the substation to see the demonstration plots for themselves.

In July 1947, Roe Foster resigned to become an agricultural adviser with E. B. Gass & Sons, an agricultural implement firm in Regina. His place was taken by Ed Molberg.

Edward Samuel Molberg was born on March 18, 1909 at Midale, Sask., and received his B.S. degree from the University of Minnesota in 1935. He worked on the family farm for 3 years before joining the Indian Head Experimental Farm in 1938 and became Acting Officer in Charge of the Regina Substation in July 1947 when Roe Foster resigned. That summer Ed Molberg completed the field test and treatments set up by Roe Foster and returned to Indian Head for the winter to write up the substation annual reports. In the spring of 1948, Ed Molberg returned to Regina to commence the season's work.

In 1948, the position of Officer in Charge of the Regina Substation was reclassified to that of Superintendent, and in the same year a competition was held by the Civil Service Commission to fill the post, which was still to be under the direction of the Superintendent of the Indian Head Experimental Farm. Roe Foster applied for the post and was duly accepted; thus on September 1, 1948 he became the first Superintendent of the substation, a position he held until 1953.

Weed control using chemical methods became a very important aspect of the work at the substation during

above left
Summer 1947
The Buffalo turbine sprayer—used in early herbicide trials to apply chemicals such as 2,4-D in either powder or liquid form.

above right
Summer 1946
Buildings at substation, looking east on 25th Avenue.

below right
Fall 1947
Combine harvesting.

the period 1945–1953. Most of these studies were conducted by Ed Molberg, who had remained at Regina and was to continue with his excellent work until his retirement in 1974. Gradually, the cultural studies that had commenced in the early 1930s and continued until 1945 were terminated in favor of the chemical weed control experiments. This new weed control work included experiments to determine the susceptibility of different weed species, the tolerance of various crops to herbicides, the determination of optimum spray volumes for weed control, an assessment as to methods of application, and a comparison of the effects of different formulations of the same herbicide on weed control. Chemical tests were also made in attempts to destroy perennial weeds, and for the control of weeds on summerfallow. Besides 2,4-D, the herbicides propham, TCA, MCPA, 2,4,5-T, and monuron were evaluated.

The use of 2,4-D became widespread during the late 1940s for the control of wild mustard on the prairies. It was hoped that repeated annual applications would result in a rapid reduction of the weed seed population in the soil, and as Roe Foster noted "... this chemical should sound the death knell of this yellow scourge of the Regina Plains ...."

It was also during this period that the Regina Substation established its close ties with the National Weed Committee (later called the Canada Weed Committee, and now called the Expert Committee on Weeds). This national society was formed in 1947, and held its first meeting in Regina during the late fall of that year.

Toward the end of the 1940s, the substation started major studies with cereals. One aspect of this work compared the growing properties and crop yields of the different varieties of wheat, oats, and barley recommended for prairie farms, and made this information available to the farmers of the district. Other cereal studies were designed to breed high-quality wheat varieties resistant to both wheat stem sawfly and rust.

During the 1940s wheat stem sawfly had become such a major pest of wheat that in 1947 a group of prairie cerealists organized a cooperative program with the primary objective of producing a variety of wheat that had all the qualities of Marquis but with sawfly resistance. The cereal breeding laboratory at Lethbridge had the overall responsibility for the program, and the Experimental Stations at Indian Head, Regina, Scott, and Swift Current assisted in the study. At Regina, plots were infested with sawfly, and in this "sawfly nursery" resistant wheatgrasses were crossed with cereals to obtain sawfly resistant wheat lines.

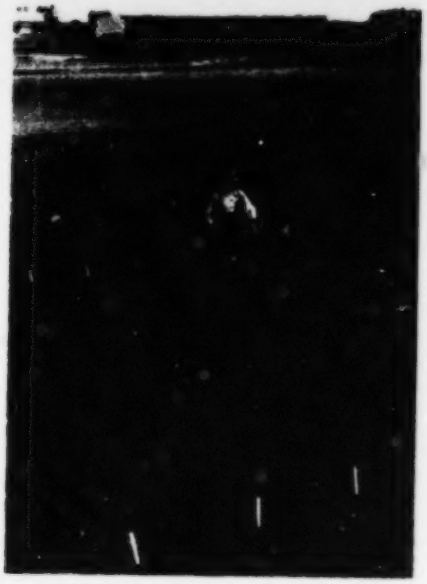
This cereal work at Regina was undertaken by Mr. E. A. Hurd. Ted Hurd started work at the substation as a student in 1948, and helped with the weed control experiments and with the cereal variety tests. Upon graduating with a M.Sc. from the University of Saskatchewan in 1951, he joined the permanent staff of the substation as a cerealist.

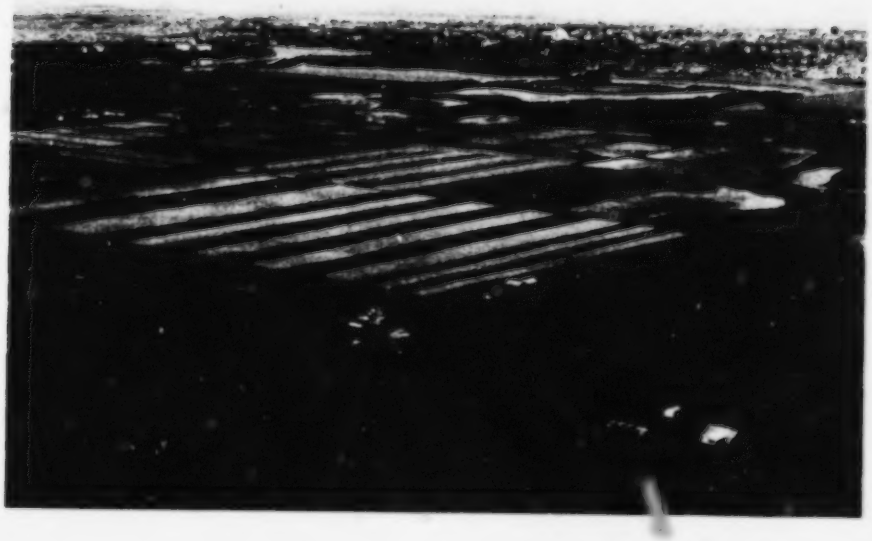
In 1950, arrangements were made for a cooperative program to investigate the pollination of alfalfa by honey bees. This project was undertaken jointly by the Apiculture Division and Forage Division of the Experimental Farms Service, and the Entomology Division of the Science Service, with the Regina Substation being selected as headquarters for the work. For the summers of 1951, 1952, and 1953, Mr. Peter Pankiw came to Regina from Ottawa to work on the project. Mr. Pankiw also conducted tests to evaluate the effects of 2,4-D on honey bees.

The new studies being done by Roe Foster, Ed Molberg, and Ted Hurd meant that more support staff was needed. In 1947, Bert Smith was taken on permanent staff, and in 1949 William Wells was hired and continued to work at the substation until 1951. That year Phil Mueller was hired, and the following year, 1952, saw the arrival of Laurie Patterson. Both Phil and Laurie are still with the station. Of course, temporary summer staff was hired as needed and as funds allowed,

above
Winter 1946–47
Substation, snowbound.

below
Edward Samuel Molberg, Acting Officer in Charge, 1947–1948.





above

Spring 1952

Mr. Ed Molberg applying 2,4-D to oats on different dates. On windy days, shields were used to prevent spray drifting to adjacent plots.

above right

Spring 1952

Dusting with malathion to wheat with 2,4-D.

center right

Summer 1952

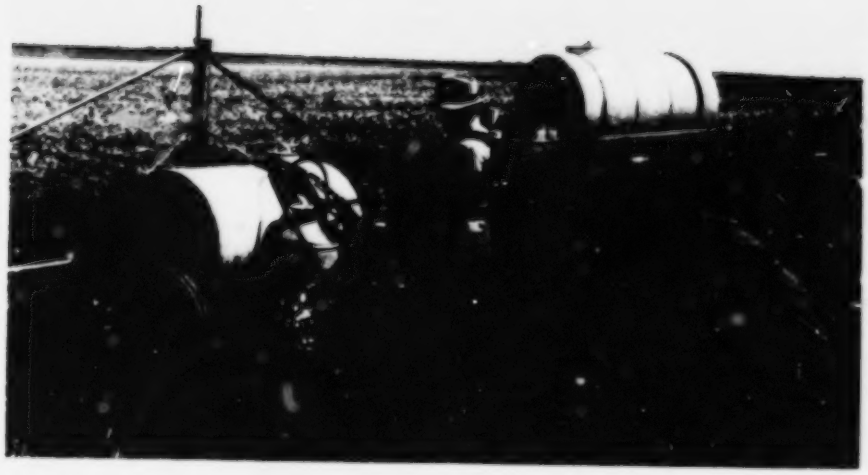
Left to right: E. A. (Ted) Hard, Cereal Breeder at substation; E. S. Higgins, Director, Experimental Farms Service, 1949–1954; and J. Roe Foster, Superintendent of Regina Experimental Substation, standing in a field of DAC 24 barley.

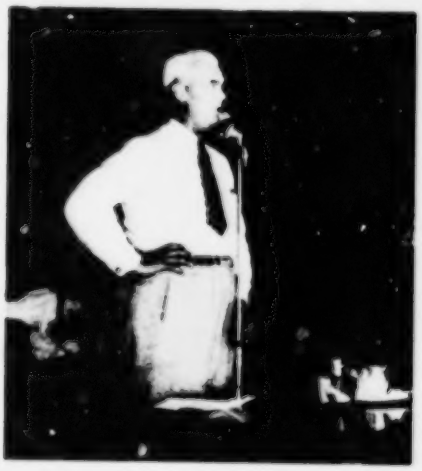
below right

Summer 1952

Aerial view from southeast.

Sutton Farm is in the lower right. The house is in south of the grove of trees, and to its east is the caretaker's residence. The Elcomdale Substation is the small group of white buildings in the upper left and the road running from left to right is 29th Avenue. Wascana Country Club lies between Sutton Farm and Wascana Creek north of 29th Avenue.





above left
1951
Aerial view of vaccination from the west

below left
Spring 1952
Sprayer with multi-tank valves for spraying small areas with many different chemicals

above right
1948
Old Post Office building which housed the first permanent village office
Regina Exhibition is displayed in front, 1950 to 1958

below right
Summer 1952
Mr. J. Roy Foster speaking at field day

Spring 1952
Nylon tent and air compressor used in applying 2,4-D combined with fertilizer elements. Stakes show locations of the treatments in the field.

The lease for the land rented from McCallum Hill & Co., Ltd. expired in 1947 and was renewed for yearly periods until 1950 when the land was finally sold and the substation lost 64 ha of land. Fortunately, in late 1949 Roe Foster was able to lease the land known as the Ross Estate, which formed the eastern half-section adjoining the substation property. Thus, the Regina Station was able to have the use of all the land in Section 8, Township 17, Range 19, West of the 2nd Meridian. Roe Foster strongly urged the federal government to buy the Ross Estate and frequently wrote long letters on the subject to Dr. E. S. Hopkins, Director of the Experimental Farms Service, and to Mr. J. G. Taggart, Deputy Minister of Agriculture. This was the same Mr. Taggart who had founded the substation in 1931, and who therefore might be expected to be sympathetic toward its future. However, the Ross Estate was not purchased and the substation had to be content with the rental of the property until the station was moved to its new location in the early 1960s.

Ever since Roe Foster had been appointed to the Regina Substation in 1945, he was tireless in trying to get new buildings to replace those dating from the early 1930s, which were, by then, in a very poor state of repair. Perhaps as a result of his constant memos and directives to Indian Head and Ottawa, a construction program was finally started in 1948. In September of that year electric power was installed, and in November, a dugout was excavated and a well, complete with a filtration system, was dug to provide a water supply for the substation. A septic tank was installed, an agronomy building was constructed, the implement shed was moved and enlarged, and a start was made on the construction of the superintendent's house, which was completed in 1949. To alleviate the crowded conditions in the bunkhouse, Roe Foster "borrowed" a bunkhouse from the PFRA in 1952. To improve the looks of the site, several hundred Colorado spruce and caragana hedges were planted around the substation buildings during 1949 and 1950.

There was still no permanent office space and during the latter part of the 1940s, suitable premises were rented during the winter in Regina, as had generally been the custom. However, in 1950 a permanent office was rented in the old Post Office building, and Miss Margaret Debenham became the first typist at the substation. Later Miss Kay Loree was to become secretary and typist.

Sometime during 1948 or 1949, no one is sure of the exact year, Regina became an independent substation directly responsible to Ottawa rather than to the Superintendent of the Indian Head Experimental Farm.

Mr. W. H. Gibson retired as Superintendent at Indian Head in 1949 and was replaced by Mr. J. G. Davidson. On the latter's retirement in 1953, Roe Foster was appointed Superintendent of the Indian Head Experimental Farm in July of that year, a position he held until his retirement in 1972. Mr. Roe Foster died in the summer of 1977, a few weeks before his 70th birthday.

Stories about Mr. Foster are numerous, and he seems to have been both a colorful and a forceful person. The period of his association with the substation saw great changes in the number of permanent staff, the start of a building program, and the development of research programs suited to postwar farming needs.

CHAPTER 5

The Regina Experimental Farm

1953–1962

In July 1953, Mr. H. W. Leggett became the next Superintendent of the Regina Experimental Substation. An Albertan, Harry Wright Leggett was born on August 16, 1915. He attended the University of Alberta, where he received his B.Sc. degree in 1941. Following war service with the RCAF, Mr. Leggett undertook further studies at the University of Saskatchewan, graduating from the College of Agriculture in 1946 with a B.S.A. That same year, he joined the staff of the Dominion Experimental Farm at Lacombe, Alta., as an agronomist in charge of the Field Husbandry Section, and remained there until his appointment to Regina.

For the most part, the period 1954–1962 were good years for the station. In early 1954 the status of the Regina Experimental Substation was raised to that of a fully fledged experimental farm. Staff increases were sanctioned, the work done at the farm was expanded with new lines of research being undertaken, and finally the long awaited building program was implemented.

Once the decision was made to improve the facilities at Regina, no time was lost. A boardinghouse was built in 1954, as was an office-laboratory building. The latter meant that the Regina Farm had finally become a functional year-round establishment. In 1955, a machine shed was constructed and a year later the Miller's house was extensively remodeled to form the foreman's residence. A seed plant was built in 1957, as well as a greenhouse, which had as its headhouse the old bunkhouse. Some landscaping was also done in 1958. By 1962, with the move to a new location imminent, the boardinghouse was converted into office quarters, and the tradition of providing accommodation for staff was discontinued.

It is sad to relate, but Mr. and Mrs. Miller did not move into the new foreman's residence. George Miller died on February 14, 1955 at the age of 66, having worked at the experimental farm a year past the normal retirement age. Mrs. Miller continued to look after the boardinghouse for a few months, then in September 1955 moved to Delta, B.C., where she still lives. She has not forgotten her many years at Regina and sends a card to the staff of the Research Station every Christmas.

In 1959, Bert Smith retired at the age of 69, having been granted three yearly work extensions. Bert continued to live in the boardinghouse for a few years before moving into the city. An avid table tennis player, he donated a table tennis trophy to the station in 1958, shortly before his retirement. Mr. Smith died on April 9, 1969 at the age of 78.

Bernard Bosgoed, Bill Watt, and Tony Zimmerman joined the field staff of the experimental farm in 1954. Tony Zimmerman and his wife Gert also ran the boardinghouse from its opening in 1955 until 1957 when Bill Watt and his wife Kay accepted that responsibility. Mr. and Mrs. Watt managed the boardinghouse until it was converted into offices in 1962. While looking after the boardinghouse the Zimmermans, and later the Watts, lived in the foreman's residence.

Kay Loree came from the office in the city to be stenographer and typist at the experimental farm until 1956, when Mary Gilhooly took over the secretarial duties. Mary remained with the farm until her retirement in 1980, by which time she was office manager. Miss Gilhooly also made coffee for the staff every day for nearly 25 years.

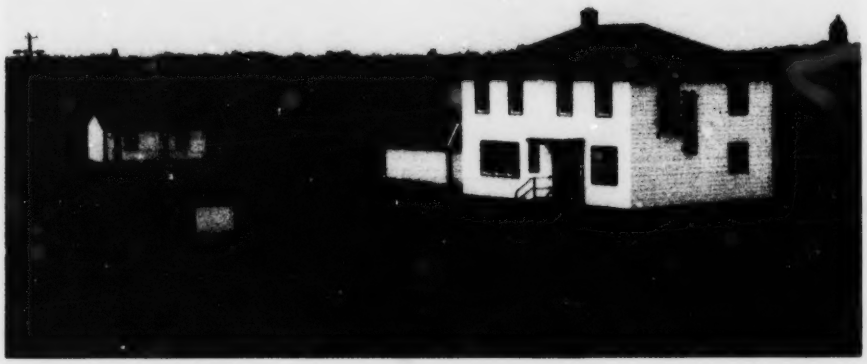
above
Summer 1953
Southeast view of Superintendent's house.

below
Harry Wright Leggett, Superintendent, 1953–1962.

In April 1957, Dr. J. D. Banting joined the professional staff as a plant physiologist to work on the problems caused by wild oats. During the 1930s, drought conditions had not favored the growth of this weed, but with the new moisture-conserving practices now in general farm use, and with the successful control of wild mustard using 2,4-D, wild oats became the major weed in the early 1950s. Jim Banting, born in Saskatchewan, had a farming background. After war service with the RCAF, he attended the University of Saskatchewan and the University of Alberta. Until his retirement in 1978, Dr. Banting worked on methods to control wild oats.

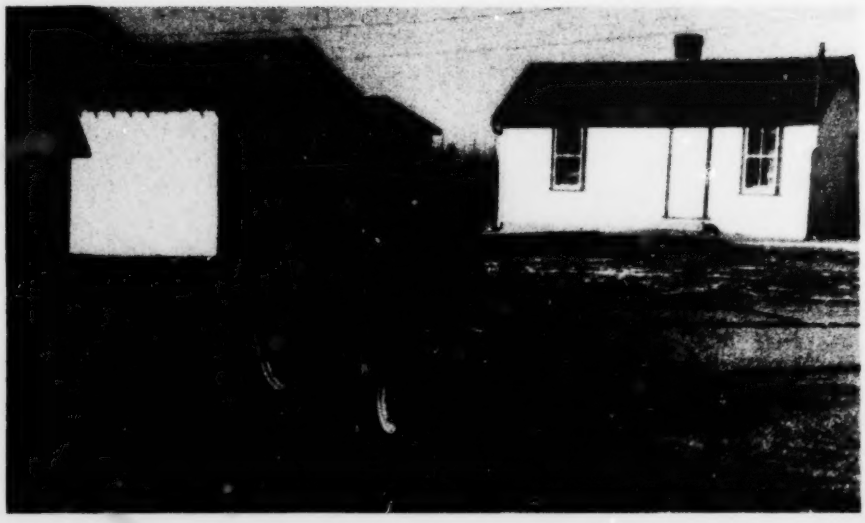
During the 1950s many studies on soil erosion, soil fertility, tillage, and crop rotations were completed and discontinued. Thus, control of weeds became a major program at the farm. Mr. Molberg made considerable progress in developing both cultural and chemical methods for the control of wild oats, and tested the effects of more than 40 different herbicides on this weed. Three of the most effective of these herbicides were diallate, triallate, and barban. Diallate and barban, first tested at Regina in 1958, proved so successful for wild oat control that diallate was recommended for commercial use in flax, and barban was recommended for trial use in wheat and barley in 1960. Diallate was eventually replaced by triallate. Other chemical studies done by Ed Molberg included the use of monuron as a soil sterilant for the control of perennial grasses and other weeds, and the use of borax for controlling leafy spurge. Dr. Banting commenced his studies on the growth habits and dormancy of wild oats and the viability of wild oat seeds, and further investigated chemical and cultural methods for wild oat control. In 1957, he initiated studies to monitor the longevity and dormancy behavior of wild oat seeds in naturally and artificially infested soils.

The cereal investigations were continued, and the testing of cereal varieties recommended for the south central and southeastern regions of Saskatchewan was expanded by Dr. Hurd, who had, during this period, gained his Ph.D. from the University of Manitoba. The cereal breeding program was maintained to develop quality



above
1950s
Bernard Bosgoed sits aboard new Massey-Harris combine.

below
Spring 1954
New boardinghouse. The old bunkhouse is on the immediate left of and slightly behind the new boardinghouse. The original office from 1931 is on far left.



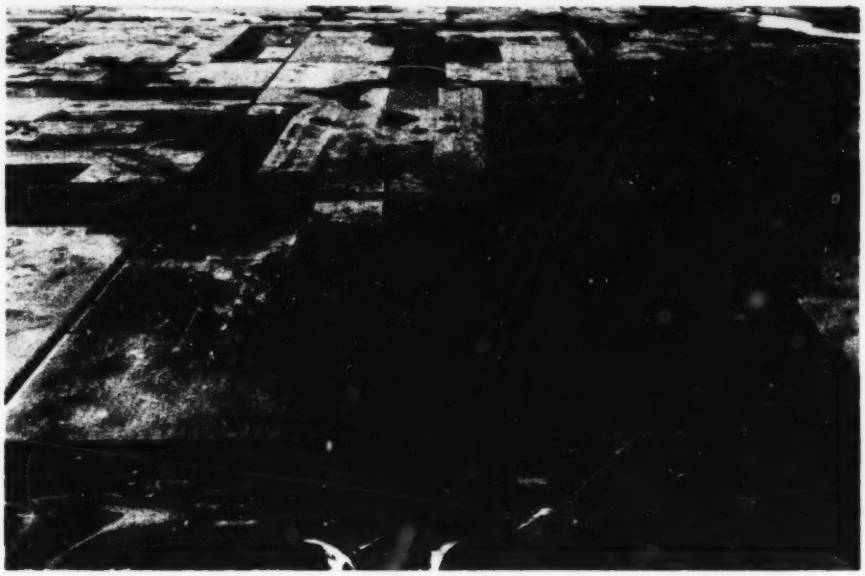
above left
Summer 1957
Dr. Jim Banting speaking on chemical control of wild oats to farmers attending the annual field day.

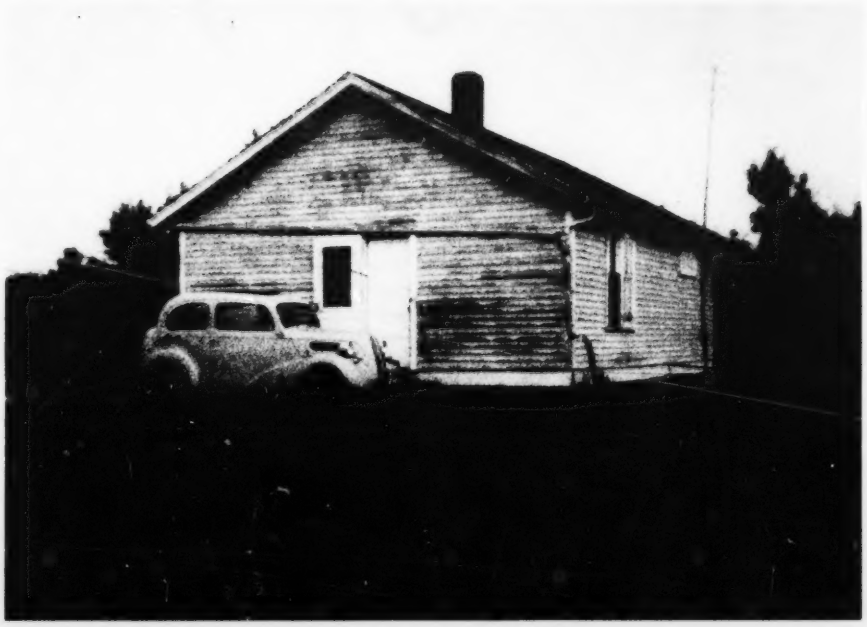
above right
Summer 1958
Grounds on the Experimental Farm remain green, thanks to dugout water and a new irrigation system.

below
Spring 1961
Patterson sprayer. This small plot sprayer was designed by Laurie Patterson specifically for applying chemicals to research plots. When spraying rod-row plots (5-m plots), half a plot on either side could be done with each pass; if 3-m yield plots were being sprayed, a full plot on each side could be done.
Sitting on the tractor is Gordy McCrystal.

rust-resistant wheats that would give good yields under the semi-arid conditions of southern Saskatchewan. Cereal crosses were continued to breed wheat varieties resistant to wheat stem sawfly. Crosses made in the late 1950s and early 1960s by Dr. Ted Hurd and Mr. Laurie Patterson resulted, several years later, in the registration of the durum wheats Wascana and Wakooma, and the spring wheat Sinton.

Sinton wheat was named in honor of Robert Sinton who had homesteaded in the Regina area in 1882, on land that was to become the new site of the Regina Experimental Farm. The Sinton farm (Section 4, Township 17, Range 19, West of the 2nd Meridian) was situated approximately 1.6 km southeast of the Regina Experimental Farm and leased by the Experimental Farms Service in 1954 so that additional cereal studies could be undertaken. There were several buildings on the Sinton farm, including a farm manager's house into which Bernard and Mary Bosgoed moved in 1954.





above
Spring 1956
The Sinton Farm looking south; the half section to the southwest of the Sinton property is the Wagoner Farm.

below
Summer 1954
The residence on the Sinton Farm. Occupied first by Bernard Bosgoed, later by Tony Zimmerman, and today by Charlie Russell, it is the only original structure remaining on the Sinton Farm.

This extra land was needed because the Regina farm had become, in 1955, the center in the Department of Agriculture for the seed increase of newly developed cereal varieties for distribution after licensing. This work resulted in the building of the seed plant at the farm in 1957. From 1955 to 1961, bulk quantities of seed of Ramsey, Pembina, and Canthatch wheat, Parkland, Pelissier, Betzes, and Keystone barley, and Raja and Cree flax were increased, cleaned, and bagged at the farm. Although the seed increase work for the Department of Agriculture was being done at Regina, the main seed office for the overall administration of the program was in Winnipeg at the research station there, under the supervision of Mr. A. B. Masson, B.S.A., M.Sc., who was also a cereal breeder. During the summer, Mr. Masson would come to Regina to oversee operations being conducted by Bernard Bosgoed, who has been in charge of the day-to-day running of the seed plant since 1957.

Work at the farm seemed to be proceeding satisfactorily and Mr. Leggett was justifiably proud of the way everything was progressing. Field employees from that period recall that every Saturday morning they reported to Mr. Leggett, who assigned them duties designed to improve the appearance of the grounds and buildings.

However, there were clouds on the horizon that were to have a profound effect on the future development of the Regina Experimental Farm.

A reorganization within the Federal Department of Agriculture in early 1959 resulted in the formation of a Research Branch, integrating the work formerly carried out by the Experimental Farms Service and the Science Service. Under the Research Branch, the work being undertaken by the Experimental Farms was to become more research oriented, with scientists from different disciplines being brought together to solve agricultural problems. As a result of the new philosophy, some experimental farms were threatened with closure and the extension work involving Illustration Stations was discontinued. At one point, it seemed that the Regina Experimental Farm might suffer the same fate, and representations were made by farmers and agricultural

organizations from the Regina district to government officials for the farm's continuance. Both Mr. Leggett and Dr. K. Rasmussen, the Assistant Director General (Western) of the Research Branch, made such reasoned arguments to Dr. C. H. Goulden, the Director General of the Research Branch, to retain the services of the Regina Experimental Farm that later, in response to a question in the House of Commons, the Minister of Agriculture, the Hon. D. S. Harkness, categorically denied that the farm was to be phased out.

The next trouble to beset the experimental farm came in 1960 when the Province of Saskatchewan began its search for a location in Regina on which to build a new university campus. At the turn of the century, it had been arbitrarily decided that Regina would become the capital of the province, while Saskatoon should have the University of Saskatchewan. By the late 1950s, the population of Regina had risen to nearly 75 000 and a second university was considered necessary.

As Regina had grown, the experimental farm was no longer 3 km outside the city, but had been absorbed by it. The city and the province wished to maintain the land on either side of Wascana Creek, which ran through the city, as a park for provincial buildings, and the Wascana Centre Authority had been organized to plan and develop this concept. These plans called for the acquisition of further land adjoining the creek for the site of the new university, the ideal location for which seemed to be the land occupied by the Regina Experimental Farm.

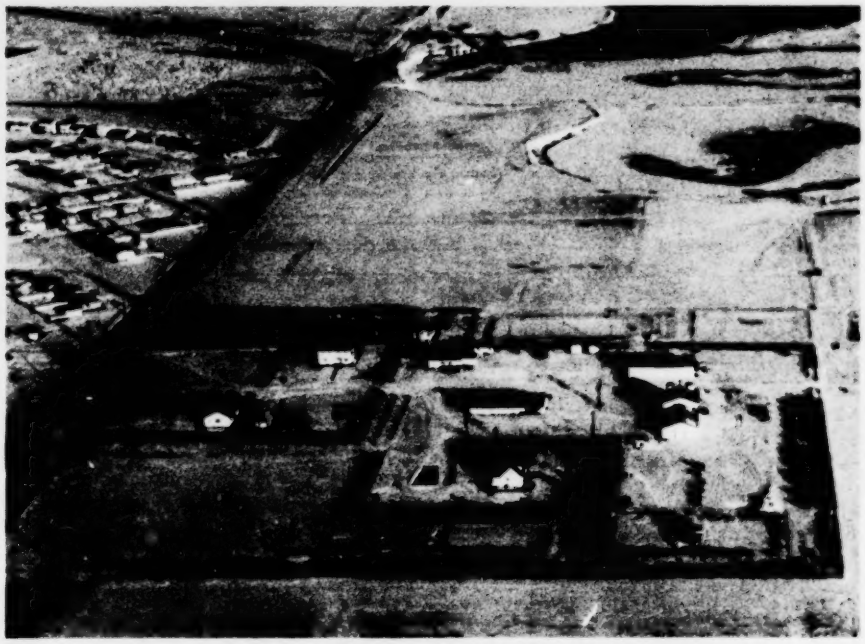
The federal government was approached by provincial representatives who offered a 25-year lease on the Wagoner property, currently owned by the Saskatchewan government, provided the Regina Experimental Farm moved to the Sinton farm and relinquish its leasehold rights to the original half-section of land leased from the province in 1940 for a 99-year period.

Mr. Leggett approached the Sinton family, with the result that the property was bought by the Department of Agriculture for use by the Experi-

mental Farm, at a cost of $562.50 a hectare. The land title to the Sinton farm was formally acquired on June 21, 1961. Mr. Leggett then persuaded the provincial government to turn over to the federal government outright title to the Wagoner property in return for the renouncement of its rights to the substation land originally negotiated by Mr. Taggart in 1931.

Although the 128-ha Wagoner property, situated on the East half of Section 32, Township 16, Range 19, West of the 2nd Meridian, was not officially transferred to the Department of Agriculture until January 1, 1963, the Regina Experimental Farm took possession of the land in late 1961. That year the Bosgoed family moved to the house on the Wagoner farm, and their place in the Sinton farm manager's house was eventually taken by the Zimmermans, who remained there until Tony Zimmerman's retirement in 1976.Thus, as a result of Mr. Leggett's efforts, the Regina Experimental Farm was relocated on 352 ha of adjoining land entirely owned by the federal government.

Having done so much to ensure the continuance of the experimental farm, Harry Leggett left Regina in July 1962 to become Emergency Measures Officer for the Canada Department of Agriculture in Ottawa, Later, he became Chief of the Grains Division. Mr. Leggett, who still resides in Ottawa, is now officially retired from government service, and employed by the Canadian Seed Growers' Association.



above
January 1961
Aerial view of Experimental Farm from the south. Winnipeg Street runs north and cuts left to Old Broad Street bridge.

below
1961
Foreman's Residence. This building consists of a new front portion, shown here, and a renovated rear section. The rear section was part of the residence built on the substation in the mid-1930s and occupied at that time by George and Stella Miller.

CHAPTER 6

The Regina Research Station

1962–1981

The policies formulated by the Executive of the newly formed Research Branch brought about changes that were to affect the Regina Experimental Farm for the next 20 years. Some of these changes were minor, such as changing the name Experimental Farms to Research Stations, with directors in charge instead of superintendents. Greater changes occurred at the Central Experimental Farm in Ottawa; instead of the former organization of divisions, the new structure embraced research institutes, regional laboratories, and research stations as complete research units dealing with specific problems. A program directorate composed of senior scientists was set up to assist in the development and coordination of the research programs to be undertaken by the institutes, laboratories, and stations. The new facilities were staffed by scientists representing a number of disciplines in order that various aspects of agricultural problems could be studied at each location. This system is essentially the same today, except that regional directors general are no longer in Ottawa. Dr. Art Guitard, the present Director General for the Western Research Stations, has his office in Saskatoon.

The future programs for the Regina Research Station were considered by the Research Branch in 1961, with the result that, as before, the three main functions were to be weed control research, cereal breeding, and the seed increase of new cereal and forage crop varieties being developed by the Research Branch.

Mr. Leggett left for Ottawa in July 1962, and Dr. J. R. Hay became the new Director of the Regina Research Station. James Robert Hay was born on October 19, 1925 in Ontario. He graduated from the Ontario Agricultural College in 1949 with a B.S.A., and went on to undertake graduate studies, which earned him an M.S. from South Dakota State College at Brookings, S. Dak., in 1951, and a Ph.D. from Harvard University, Cambridge, Mass., in 1955. He specialized in plant physiology, and in 1955 joined the Field Husbandry Division (reorganized in 1959 as Plant Research Institute) of the Central Experimental Farm in Ottawa. By 1962, Dr. Hay was Head of the Weed Research Section at the Institute. In April 1962, he was transferred to the Regina Research Station to head up the weed control work.

left
James Robert Hay, Director, 1962–1980.

below
Spring 1962
The seed-cleaning plant.

With the extensive use of herbicides by the end of the 1960s, concerns about their environmental impact were also recognized. Thus, the long-term weed control program called for studies in the areas of agronomy, ecology, plant physiology, biochemistry, soil science, and chemistry. The agronomic work was to be directed toward the control of all weeds in field crops, and the ecological studies were to include surveys of weed populations on the prairies, and the collection of information on life histories of weeds. Plant physiological research was required to study the dormancy of weed seeds and the growth and development of weeds. The mode of action of herbicides was also to be investigated. Scientists with training in biochemistry, soil science, and chemistry were necessary to study the fate and degradation of herbicides both in the plants and soil, and their impact on environmental quality. During the next 20 years this overall program for weed research has been successfully developed.

Dr. Hay's early months at the Research Station must have been as chaotic as those experienced by Mr. Chepil 30 years earlier. Not only was there the research program to organize, but also the move to the Sinton farm to supervise. Unfortunately, this move did not merely involve transferring a couple of small buildings and some equipment, which was all Mr. Taggart and Mr. Chepil had to oversee. It was a large-scale operation concerning the transfer of staff, equipment, and five large buildings—the seed plant, the machine shed, the greenhouse, the laboratory-office building, and the small agronomy building that was to become the chemical storage shed.

The move began in 1962 and was not completed until the winter of 1963-64 with the arrival of office staff and scientists. During this time, and with the exception of the superintendent's house, the foreman's residence, and the boardinghouse, which were sold, the various buildings were transferred to the new location. Then, almost immediately, a building program was started with extensions being made, in 1962, to the machine shed and the seed plant. In 1963, the agronomy building was constructed, and a year later a pump house was erected to pump wastes into the sewage lagoon. A machine shop and garage complex was built in 1965.

Despite the confusion, more professional staff was engaged to implement the weed research program at the Research Station. Dr. J. F. Alex arrived in 1962 and a year later Dr. R. Grover came.

In early 1964, Mr. Ed Molberg was the agronomist working on cultural and chemical methods for weed control. Dr. Banting was conducting dormancy and viability studies with wild oat seeds, and commencing basic studies to determine the mode of action of wild oat herbicides. He was also developing more efficient soil incorporation procedures to increase the selectivity of the newly discovered wild oat chemicals, diallate and triallate. Dr. Hurd was responsible for the cereal breeding and seed increase programs, which had remained unchanged.

Dr. Jack Alex, plant ecologist and taxonomist, received his training at the University of Saskatchewan and Washington State University. Before coming to Regina he worked at the Plant Research Institute in Ottawa. Jack Alex remained at the Regina Research Station until 1968, when he left to take up a position with the University of Guelph. During his years at Regina he started the herbarium, carried out competition studies between various weeds and crops, and made a large-scale survey of prairie weeds.

Dr. Rajbans Grover received his education both in India and in the United States. Before his appointment to the Regina Research Station, he had just started work on the biochemical aspects of tree seed dormancy at the Dominion Forest Nursery Station, Indian Head. A plant physiologist and biochemist by train-

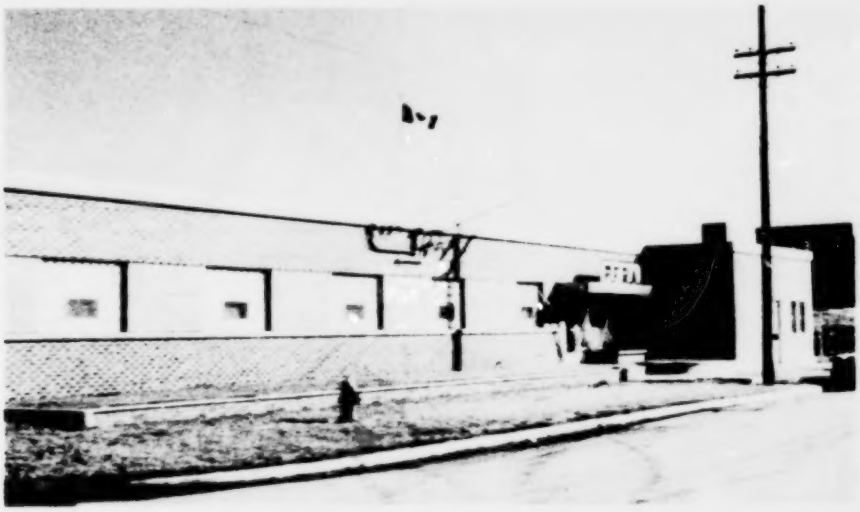
above

Spring 1962
Greenhouse, Experimental Farm. Headhouse is former bunkhouse originally built in 1930s.

below

Fall 1962
Office and laboratory building.

left
Rajbans Grover, Acting Director, 1980–



right
1968
The Prairie Farm Rehabilitation Administration (PFRA) workshop at 1305 Ottawa Street was the 'home' of Drs. Banting, Grover, McIntyre, and Smith and their staff until laboratories were built at the Research Station in 1971.

ing, during his years at the station Raj Grover has initiated the program on the movement of herbicides in the environment after their application. This work has included research into drift losses during spraying, and post-application losses such as leaching, runoff from treated fields in spring flooding, and volatilization.

The appointment of Dr. Grover was a break from the traditional practice at Regina of hiring professional staff with farming background, or agricultural degrees, and was in keeping with the Research Branch policy of employing scientists from different disciplines.

Because of the shortage of space at the Research Station, Drs. Banting and Grover had, in 1963, temporary office and laboratory space in a PFRA warehouse at 1305 Ottawa Street, in the northeastern part of Regina. Although the conditions were spartan and the laboratory was located about 6 km from the main Research Station, work was started and progress made.

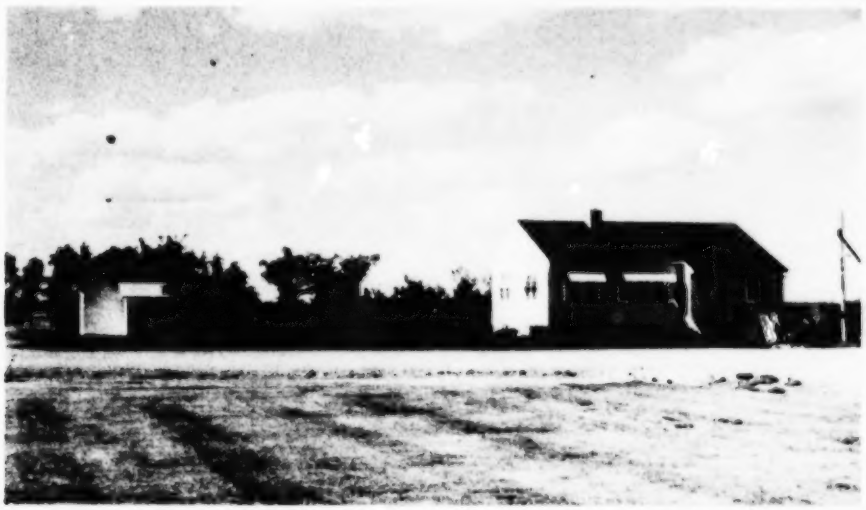
The weed section gained the services of Dr. G. I. McIntyre in 1964. Gordon McIntyre, who had received training as a botanist and plant physiologist, both in Britain and in the United States, joined Drs. Banting and Grover, in what was euphemistically called the downtown lab. There he started work on the physiology and development of perennial weeds, a project that he is still continuing.

In 1964, the duties associated with the cereals program at the Regina Research Station were divided so that there were now three sections—the Weed Section, the Cereal Breeding Section, and now, the Seed Section. Dr. Hurd retained the responsibility for the cereal breeding projects, but the new Seed Section was organized to cover, not only the seed increase work already being undertaken, but to carry out variety verification tests, and to maintain the Canadian genetic seed stocks for the Department of Agriculture. On January 1, 1964, Mr. G. R. Boughton, B.S.A., M.Sc., transferred from the Regina Office of the Plant Products Division of Canada Department of Agriculture to the Seed Section at the Regina Research Station.

As mentioned in Chapter 5, Mr. Masson of the Winnipeg Research Station was in charge of the seed increase work at Regina. With the additional responsibilities assigned to the new Seed Section, Mr. Masson came to Regina from Winnipeg in 1965 to take overall charge of the section and its various activities. However, his stay was relatively short; the next year he transferred to the Production and Marketing Branch of Canada Department of Agriculture, in Ottawa. His position at Regina was taken, in 1966, by Mr. E. D. Mallough, B.S.A., formerly with the Plant Products Division in Regina.

Dave Mallough was to remain in charge of the Seed Section until 1979, when he left Regina to go to Tanzania with a CIDA-sponsored program. Today Glenn Boughton looks after the affairs of the Seed Section. It should be mentioned here that since October 1966, the winter production of plant breeding material has been carried out at Brawley, Calif., by members of the Seed Section.

Mr. G. G. Bowes came to the Research Station from the University of Manitoba, after receiving his M.Sc. in 1966, and started a research program to study the effects of weeds on rangeland and native pastures and to develop cultural and chemical methods for their control. In December 1968, Garry Bowes was granted a 3-year educational leave to study for his Ph.D. degree, which he obtained at the University of Guelph.



In February 1967, Dr. Ted Hurd left the station for a 3-year assignment at the Plant Breeding Station at Njoro, Kenya. On his return to Canada in 1970, he was transferred to the Research Station at Swift Current to take charge of the cereal breeding program there. His move from Regina meant the end of the formal cereal breeding program at the Research Station, although the evaluation of cereal varieties was still continued by Laurie Patterson.

During the late 1960s, increases in the numbers of both professional and support staff resulted in a chronic space shortage at the Research Station. In 1966, detailed plans were completed for an office-laboratory complex to house all the staff. However, because of government austerity, this was never built and the Research Station had to continue with overcrowded facilities for several more years. The space rented from the PFRA in 1963 was equally congested. In 1967, Dr. Raj Grover spent a sabbatical year with the Weed Research Organization at Oxford, England, and during his absence, his ofrice and laboratory space was used by Dr. A. E. Smith, who had just been appointed to the staff. Trained in Britain and in the United States, Dr. Allan Smith had worked on the fate of herbicides in the environment for an industrial concern, before coming to Canada. At Regina he was to develop sensitive procedures for the extraction and analysis of herbicide residues from soils and waters, and study the soil persistence of such chemicals under prairie field conditions.

On Dr. Grover's return in 1968, Dr. McIntyre went to Ottawa for a year to investigate the development of the root systems of quack grass and leafy spurge. However, the exchange of space in the downtown lab. was most unsatisfactory. At last a building program was sanctioned and in 1968 an extension to the agronomy building, incorporating office, laboratory, and growth chamber facilities was constructed for use by Gordon McIntyre.

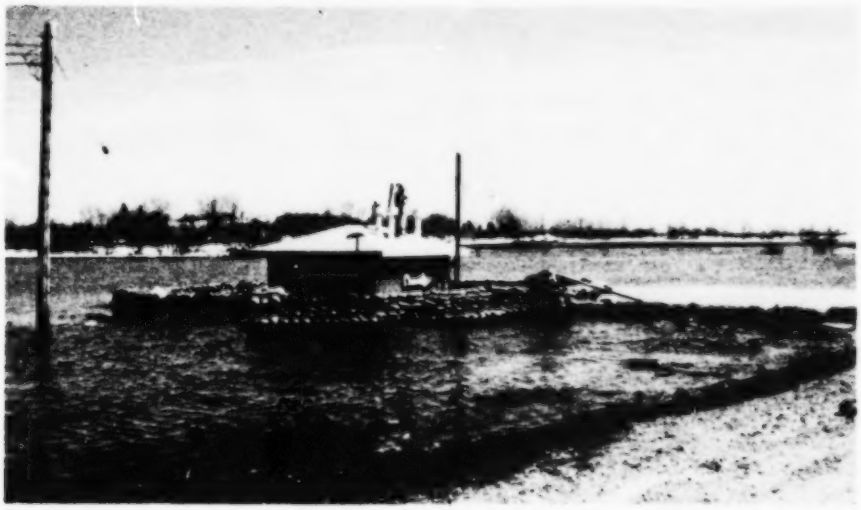
A further office-laboratory complex was started in late 1970 and completed in the spring of 1971, so that Drs. Banting, Grover, and Smith, together with their technical help, could leave the temporary quarters in the city. Thus, almost 10 years after leaving the old site, the entire staff was finally united in one facility. The staff of the Research Station was happy when in 1973, the dirt road leading to the station was paved, and drivers no longer had to contend with quagmire conditions after a rainfall.

Mr. Keith Best joined the Research Station in 1970, as weed biologist and taxonomist. A long-time member of the staff at the Swift Current Research Station, he had recently been attending the University of Manitoba, and came to Regina on being awarded an M.Sc. Before his retirement in 1978, Keith Best enlarged the herbarium and identified numerous plant specimens sent in by farmers and the general public.

Mr. Ed Molberg was due to retire in 1974. His work involving the testing of new and experimental herbicides, and their effects on both weeds and crops, was considered so important that it was decided there should be no pause in the continuity of these studies. Thus, in 1971 Dr. J. H. Hunter, who had just been granted a Ph.D. from the University of Manitoba, was appointed to take over this research on Mr. Molberg's retirement.

Two more research scientists were added to the staff in 1971. Dr. S. U. Khan, a soil chemist, was transferred to Regina from the Research Station at Lacombe to undertake work on the interaction of herbicides with various soil colloids; and Mr. G. S. Emmond, a soil scientist, came from the Experimental Farm at Indian Head to work on herbicide residues in soils. Dr. Khan left in 1973 to accept a position with the Chemistry and Biology Research Institute in Ottawa, and Mr. Emmond resigned in 1974 to take a post with the B.C. Department of Agriculture.

In 1972, a new dimension was added to the science of weed control at Regina, with the transfer of three entomologists from the Research



Institute at Belleville, Ont. Dr. Peter Harris, Dr. Diether P. Peschken, and Mr. Murray G. Maw, all of whom had received training both in Canada and Europe, came to work on the biological control of weeds. Also in 1972, a new laboratory with greenhouse and quarantine facilities was constructed for the screening of the candidate insects that were to be released to control specific weeds. Their program provides a nationwide service.

With the completion of the construction work for the biological control unit in 1972, no further improvements were made until 1980 when the car park and some of the access roads were paved, and an addition to the headhouse of the old greenhouse was built.

By the end of 1972, administration of the various programs was becoming unwieldly. Essentially there were only two sections. Dave Mallough and Glenn Boughton were in the Seed Section and the rest of the staff were in the Weed Section. Clearly some rearrangement was necessary. Accordingly, four sections were organized: the Biological Control of Weeds Section with Dr. P. Harris (head), Mr. M. G. Maw, and Dr. D. P. Peschken; the Weed Control Section with Dr. J. D. Banting (head), Mr. K. F. Best, Dr. G. G. Bowes, Dr. J. H. Hunter, Dr. G. I. McIntyre, and Mr. E. S. Molberg; the Herbicide Behaviour in the Environment Section with Dr. R. Grover (head), Mr. G. S. Emmond, Dr. S. U. Khan, and Dr. A. E. Smith; and the Seed Section with Mr. E. D. Mallough (head) and Mr. G. R. Boughton.

Another important unit was the Maintenance Section, which kept the station's services functioning efficiently. Tony Zimmerman was in charge of the Maintenance Section until 1976, when Charlie Gelowitz took over. When Charlie Gelowitz left government service in 1978, Basil Parks came from the Brandon Research Station to look after the section.

By 1973, the Research Station was considered important enough to rate an administrative officer to help Dr. Hay with the burgeoning paper work. Mr. Don Gourlay filled that position in 1973. The appointment of a library technician occurred in 1973, and the library, instead of being a collection of books and journals under the ministrations of a committee of scientists, came under the care of trained library personnel. Mrs. Joan McDonald was library technician from 1973 until 1977, when Miss Charlotte Vanstone took over the duties.

On the retirement of Mr. Roe Foster in 1973, the Indian Head Experimental Farm became a substation of Regina.

During the 1970s, scientific staff appointments continued. A new national program on the generation of herbicide residue data for minor crops was assigned to the station. To carry out this program, Dr. Allan Cessna, an organic chemist from the University of Saskatchewan, joined the Herbicide Behaviour in the Environment Section in 1974 to analyze for herbicide residues in minor crops. In 1975, Dr. A. Gordon Thomas, a weed ecologist from the University of Guelph, came to the station to conduct research on population dynamics of weeds. In his relatively short time in the Weed Control Section, Gordon Thomas has successfully developed a national weed survey program and carried out several weed surveys for Saskatchewan, Manitoba, British Columbia, Newfoundland, and Prince Edward Island. Dr. Andrew Hsiao, a plant physiologist with training from Taiwan, Canada, and the United States, started work in the Weed Control Section in 1977 on the germination mechanisms and dormancy of wild oats and other weed seeds. A year later Dr. Larry Hume, an ecologist trained at the University of Western Ontario, joined the Weed Control Section to conduct research into crop losses caused by weeds. The most recent addition to the Regina Research Station arrived on January 2, 1981, when Dr. Knud Mortensen became a member of the Biological Control Section. With training in plant pathology from both Denmark and Canada, Dr. Mortensen will investigate the use of rust diseases as weed control agents.

By 1978, the Weed Control Section had become quite large, and on the retirement of Dr. Banting that year it was reorganized into two sections—the Weed Ecology Section with Dr. A. G. Thomas (head), Dr. G. G. Bowes, and Dr. L. Hume; and the Weed Physiology Section with Dr. G. I. McIntyre (head), Dr. A. I. Hsiao, and Dr. J. H. Hunter.

The retirement of Mr. Molberg in 1974 and of Dr. Banting in 1978 were sad occasions, for both scientists had done excellent research at the Research Station. Ed Molberg had a very perceptive eye and would often stand in front of his plot treatments and make observations that were not easily apparent to other people. Many of the conclusions he drew were of importance and had a lasting effect. He discovered that benazolin would control mustard in rape seed. Before this, there were no chemical treatments that would control this weed in the oilseed crop without extensive crop damage. Ed Molberg also found that wild oats could be controlled in flax using asulam, and that propanil would control green foxtail in cereals.

Perhaps Jim Banting's most significant contribution, beyond the fact that he was one of Canada's foremost experts on wild oats, was his development of practical application methodology for the treatment of soil with the wild oat herbicide triallate. By incorporating this chemical into the top 5 cm of soil, Dr. Banting showed that the wild oats, which were mostly located in, or had to grow through the treated band, were selectively killed, while the wheat sown below the chemically treated soil would grow without damage. Much of Jim Banting's work on wild oats has been summarized in Agric. Can. Publ. 1531, *Growth habits and control of wild oats*.

No history of the Regina Research Station would be complete without a word of praise for the technical and support staff. Often these unsung heroes carry out most, if not all, of a research scientist's program. The Regina Research Station has been lucky in that many of the staff members have stayed for many years. All the permanent staff engaged before 1962 have been named in previous chapters of this history. Because it is not possible to name all the permanent staff members for the period 1962–1981, they have been recorded in the Appendix.

However, some long-time technical staff members must be mentioned. There is Phil Mueller, who came in 1951 and is currently working in the Weed Ecology Section; Laurie Patterson, who started in 1952 and has been responsible for the development of agricultural equipment that has proved useful at this and other research stations; Bernard Bosgoed and Bill Watt, who joined in 1954 and are still going strong; Don Clemence who has almost 20 years of continuous service; Lorne Kerr, who came in 1963 to work for Dr. Raj Grover—and still is; Mike Schneider, Robin Wise, and Lee Wood who have been here 14 years; John Mitton, who retired in

opposite page • above

February 1978
Research scientists from the Biological Control Section remove snowdrifts from greenhouse roof in an attempt to keep the roof from collapsing.

opposite page • below

February 1978
Rock-hard snowdrifts reach the eaves of the laboratory building following a 3-day blizzard.

above

1979
Murray Maw and Margaret Molloy working on a project for the biological control of leafy spurge near Saskatchewan Beach.

below

1979
Don Clemence watches Allan Strachan operate the six-row plot seeder built for the station at the Swift Current Station.

1977 after 11 years; and Brian Hayden, who has a mere 10 years as technical assistant to Dr. Allan Smith and who also acts as station photographer and custodian of the darkroom.

The announcement was made in late 1980 that Dr. Jim Hay, Director of the Regina Research Station since 1962, was to leave at the end of the year to become Director of the Saskatoon Research Station. During his career, Dr. Hay has become a well-known and distinguished authority on weeds and their control. He has been a very active member of the Canada Weed Committee, now known as the Expert Committee on Weeds, and from 1963 until 1980 was the Chairman of its Research Appraisal and Recommendations Committee. For 9 years, from 1969 until 1977, he was Chairman of the National Executive. A long-time member of the Weed Science Society of America, he was its President in 1979, the first Canadian to hold that office. Dr. Hay was elected a Fellow of that Society in 1975.

On Jim Hay's departure in January 1981, Dr. Raj Grover was appointed Acting Director of the Regina Research Station until the position of Director is filled.

CHAPTER 7

Postscript

left

1979

Dr. Jim Hunter examines an experimental spinning-disk sprayer to be adapted for plot spraying.

right

1979

Ron McCrystal releases an insect into a field cage to test its potential as a biological-control agent for Canada thistle.

Although the major achievements of individual scientists at the Regina Research Station have been recorded in this history, mention should be made of the day-to-day work carried out during the last 20 years. This work, much of which seems to be unspectacular and routine has, nevertheless, contributed to the excellent reputation of the Regina Research Station.

The herbicide testing program carried out by Ed Molberg and then by Jim Hunter and their staff, has meant the evaluation of hundreds of experimental chemicals for weed control and crop tolerance. All the herbicides registered for use in Western Canada have thus been tested at Regina. On a smaller scale, herbicide treatments for the control of aspen, poplar, balsam poplar, and prairie rose in pastures have been developed by Garry Bowes and adopted for general use.

Garry Bowes and Jim Hunter have been responsible for the development of computer programs that will enable herbicide data from weed control and crop tolerance studies, gathered from scientists across Western Canada, to be collated and printed in a form for use by the Expert Committee on Weeds.

The Biological Control of Weeds Section has an international reputation for the control of weeds using released insects. Not only has the section developed criteria, subsequently adopted by other laboratories, for assessing the suitability of a weed for control by biological agents, but has also pioneered procedures for the selection and screening of potential agents. Since starting the program at Belleville, the section has released 27 insect species and one species of nematode as possible control agents for 14 weed species in eight provinces. Of these, 17 insect species and the nematode species have been established. As a result, a major reduction in stands of St. John's-wort, nodding thistle, tansy ragwort, and toadflax has been achieved.

An important area of research has been that of plant physiology. Studies in this discipline date from the time of Bill Chepil and John Cameron, who showed that the seeds of wild mustard remain viable in the soil for many years, and will not germinate unless they are in the top 1.3 cm of soil. The germination properties of wild oat seeds have been continuously studied for nearly 25 years, with the hope that a procedure can be found to break the seed dormancy of this

above

January 1981
Caretaker's residence and the library after heavy hoarfrost.

below

January 1981
Main entrance of the office and laboratory building.

most troublesome weed. But despite the efforts of Jim Banting, and more recently of Andy Hsiao, there seems to be no simple solution to this problem. Andy Hsiao has also developed very sensitive bioassay procedures for the determination of trace amounts of herbicide residues in soils.

The excellent weed surveys conducted by Gordon Thomas have, for the first time, provided quantitative and statistically reliable data for five Canadian provinces. Today, the Weed Ecology Section is continuing the work of John Cameron and Jack Alex on crop losses caused by weeds, and is obtaining data to predict losses resulting from various densities of weed seedlings in a variety of crops.

Dr. McIntyre's many years of painstaking research on the effects of light, water, and nutrients on plant growth has led to new insights into plant development.

The Herbicide Behaviour in the Environment Section has done much to determine what happens to herbicides after they have been applied. A major project was carried out to evaluate the factors affecting the droplet drift potential when herbicides are sprayed from different types of equipment, including aircraft; air monitoring studies were conducted to constantly measure the minute amounts of herbicides in the air during the summer

season. From these and similar experiments, it was concluded that vapor losses from the volatile butyl ester formulations are the major cause of environmental contamination by 2,4-D, and recommendations were made for the phasing out of these formulations. This work has also resulted in recommendations that have led to the reduction of herbicidal drift and ensured maximum deposition on the target area. Detailed adsorption studies have been made, both in the laboratory and under field conditions, to assess the movement and leaching properties of many herbicides commonly used on the prairies.

Analytical methods have been developed for the routine determination in soils of more than 40 different herbicides at the 0.05 ppm level. The soil persistence of 30 herbicides used on the prairies has been studied under field conditions at different locations, and the various factors affecting their degradation in soils determined. Degradation products of several herbicides have been isolated from soils and identified. Recently, a program to investigate the persistence of herbicides in soils when used in combination with other pesticides has been started. The program for the determination of herbicide residues in minor crops has resulted in the development of analytical methodology for the extraction and analysis of low levels of herbicides in a variety of plant materials, and data has been obtained concerning the residues of 15 herbicides in a total of seven crops from eight provinces.

The Seed Section's seed program which involves the cooperative testing with other research stations of new varieties of cereal, forage, oilseed, and pulse crops has been continuously carried out since 1954. During this time, several thousand varieties and lines have been assessed at sites both on and off the station, and the work has led to the licensing, seed increase, and distribution of 116 varieties and lines of 21 different crop types. Another major project of the Seed Section has entailed the task of verification, which involves the field testing of crop seed to check on the genetic purity of the various varieties commercially available.

Since 1962, the excellent research conducted at the station has resulted in more than 220 scientific publications in the literature. So much useful information was being obtained that the position of information officer was created in 1975. Mr. Gayle Honey held the position from 1975 to 1978 and Miss Betty Guild took over from 1979 to 1980.

The further success of the Research Station can be measured by the fact that three postgraduate students from the University of Regina have completed their M.Sc. thesis research at the station under the supervision and direction of Dr. Jim Banting, Dr. Raj Grover, and Dr. Gordon Thomas. Another student, supervised by Dr. Peter Harris, was awarded a Ph.D. from the University of Saskatchewan. The Research Station has also hosted three visiting scientists as postdoctoral fellows.

Acknowledgments

Many people have contributed to this history, but to the following I am particularly indebted:

Mr. A. Aitken
Dr. J. D. Banting
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Dr. W. Darcovich
Mrs. J. L. Donegan
Government of Saskatchewan Archives
Mrs. D. Hay
Dr. J. R. Hay
Mr. H. A. Hunt
Mr. H. W. Leggett
Mr. E. V. McCurdy
Mr. R. N. McIver
Mrs. S. Miller
Mr. E. S. Molberg
Mr. P. H. Mueller
Mr. P. I. Myhr
Dr. P. Pankiw
Mr. L. A. Patterson
Dr. D. M. Secoy
Mr. W. B. Towill
Miss H. C. Vanstone
Mr. G. W. Watt
Mr. H. J. Wiley

Appendix

Permanent staff who have worked for at least one year at the Regina Research Station.

Directors

W. S. Chepil, B.S.A., M.Sc.	1931–1936	H. W. Leggett, B.Sc., B.S.A.	1953–1962
J. Cameron, B.S.A.	1936–1945	J. R. Hay, B.S.A., M.S., Ph.D.	1962–1980
J. R. Foster, B.S.A.	1945–1947 1948–1953		

Professional Staff

W. Darcovich, B.S.A.	1944–1945	K. F. Best, M.Sc.	1970–1978
E. S. Molberg, B.S.	1947–1974	J. H. Hunter, Ph.D.	1971–
E. A. Hurd, Ph.D.	1951–1970	G. S. Emmond, M.Sc.	1971–1974
J. D. Banting, Ph.D.	1957–1978	S. U. Khan, Ph.D.	1971–1973
J. F. Alex, Ph.D.	1962–1968	P. Harris, Ph.D.	1972–
R. Grover, Ph.D.	1963–	M. G. Maw, M.Sc.	1972–
G. R. Boughton, M.Sc.	1964–	D. P. Peschken, Dr. Sci. Agr.	1972–
G. I. McIntyre, Ph.D.	1964–	A. J. Cessna, Ph.D.	1974–
A. B. Masson, M.Sc.	1965–1966	A. G. Thomas, Ph.D.	1975–
E. D. Mallough, B.S.A.	1966–1979	A. I. Hsiao, Ph.D.	1977–
G. G. Bowes, Ph.D.	1966–	L. Hume, Ph.D.	1978–
A. E. Smith, Ph.D.	1967–	K. Mortensen, Ph.D.	1981–

Administrative Officer

D. I. Gourlay	1973–

Library Technicians

J. I. McDonald	1973–1977	H. C. Vanstone	1977–

Information Officers

G. K. Honey, B.S.A.	1975–1978	B. C. Guild, B.H.Ec.	1979–1980

Office and Clerical Staff

M. Debenham		M. J. Robb	1972–1977
K. Loree		P. A. C. Ball	1974–1976
E. M. Gilhooly	1956–1980	L. C. M. Glasser	1975–1977
M. Hillyard	1964–1972	M. J. Ash	1976–1979 1980–
V. M. A. Barzan	1965–1973	G. M. Posehn	1976–1981
H. M. Leib	1965–1972	A. J. Hepburn	1977–1980
D. G. Brailean	1972–1974	F. F. Steiner	1979–1980
V. A. Chapman	1972–1974	A. H. Fleury	1980–

Technical and Support Staff

G. Miller	1931–1955
A. E. Smith	1943–1959
W. Wells	1949–1951
P. H. Mueller	1951–
L. A. Patterson	1952–
B. Bosgoed	1954–
G. W. Watt	1954–
A. Zimmerman	1954–1976
K. Strugnell	1956–1958
G. F. Goertzen	1956–1972
R. C. McCrystal	1958–1980
L. V. Tebb	1958–1966
J. Shuya	1960–1968
A. O. Beug	1960–1974
G. W. Lindenbach	1961–1973
D. E. Clemence	1962–
J. P. Gebhardt	1962–1966
M. J. Clemence	1963–1966
L. A. Kerr	1963–
G. E. McCrystal	1964–1970
J. Smith-Windsor	1965–1968
J. G. Mitton	1966–1977
A. B. Harris	1967–1968
S. O. Mihalicz	1967–1971
M. A. Schneider	1967–
R. F. Wise	1967–
E. L. Wood	1967–
A. Fitzpatrick, B.Sc.	1968–1970
W. W. Fleming	1968–1976
R. Richards, B.Sc.	1969–1970
A. N. Dmitruk	1971–1974
B. J. Hayden	1971–
M. J. McPherson	1971–1973
R. A. Ferguson	1972–
R. D. Mazurkewich	1972–1973
M. M. Molloy	1972–
R. O. Voroney, B.A.	1972–1976
E. S. Flett, B.A.	1973–1979
G. O. Dokken	1973–1975
J. L. Nerland	1973–1977
C. E. Gelowitz	1974–1978
M. F. Nelson	1974–1975
B. R. Pannell	1974–1975
H. J. Ritchie	1974–1977
T. W. Anderson	1975–1977
E. P. Lockwood	1976–1977
M. G. Loydl	1976–1981
S. J. Novak	1976–
K. Reid, B.Sc.	1976–1978
C. A. Russell	1976–
M. L. Aldred	1977–
S. F. Benjamin	1977–
D. T. Mailhot	1977–
S. G. Kopp	1977–1978
M. E. McGregor, M.Sc.	1977–1979
J. J. Soroka, B.Sc.	1978–
A. G. Strachan	1978–
J. A. Hume, B.Sc.	1979–
B. W. A. Parks	1979–
J. L. Derby	1981–
A. C. Dyck	1981–